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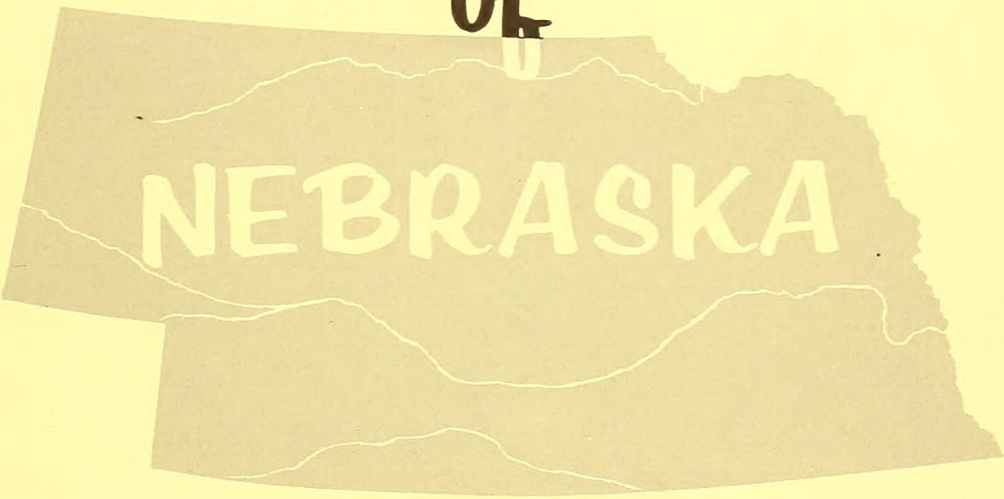
THE FOREST RESOURCE of NEBRASKA



by

Robert N. Stone & Walter T. Bagley

ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Raymond Price, Director
Fort Collins, Colorado

FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

HIGHLIGHTS

Since the days of the first settlers, millions of trees have been successfully planted in this agricultural State to provide protection for farmsteads, animals, and crops.

Millions of trees have been harvested for lumber, posts, and firewood. These were very important commodities of the early pioneers.

Little effort has been expended in care or management of the forests for wood production. The good trees were cut, leaving the culls. The result is poorly stocked stands of low-quality species.

Wood production is far below the full potential in quantity and quality. Markets, except for high-quality walnut and bur oak, do not provide favorable opportunities for profitable utilization.

The forest area of Nebraska totals 1,072,600 acres or 2.2 percent of the land area. Both eastern and western timber types are found within the State.

Ninety-one percent of the forest land is privately owned, mostly by farmers and ranchers. These ownerships include 91 percent of the total growing stock and 92 percent of the sawtimber.

The elm-ash-cottonwood type occupies 60 percent of the commercial forest land. Twenty-five percent is ponderosa pine type. Bur oak occupies another 11 percent, and the remaining 4 percent is in miscellaneous hardwood types.

Of the commercial forest land, 53 percent is classed as rough upland and 38 percent as bottomland. The remaining 9 percent is level upland.

The sawtimber volume is 42 percent cottonwood and 20 percent ponderosa pine. The remaining sawtimber is divided among many hardwood species.

Forty-five percent of the commercial forest land is heavily grazed. Heavy grazing and poorly stocked forest land are usually found together.

Timber cut can be increased if good management practices are instituted. Net annual growth of sawtimber is 68.8 million board feet while annual cut and annual mortality total 18.2 and 5.8 million board feet, respectively.

Net annual growth of all growing stock amounts to 14.0 million cubic feet, compared with the annual cut and annual mortality of 4.0 and 1.5 million cubic feet, respectively.

THE FOREST RESOURCE OF NEBRASKA

by
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Forest Service U. S. Department of Agriculture
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PREFACE

This report presents the findings of the first Statewide Forest Survey of Nebraska, made as part of the nationwide Forest Survey authorized by the McSweeney-McNary Act of 1928. Earlier estimates of the State's forest resources have been made, but this report presents results of the first inventory using modern sampling techniques and specified standards of accuracy.

The report resulted from the following cooperative efforts:

Preliminary planning and a large part of the field inventory were done by personnel of the Central States and the Lake States Forest Experiment Stations. The timber-harvest part of the survey was compiled by the Rocky Mountain Forest and Range Experiment Station from field data collected by the Nebraska Agricultural Extension Service. The Agricultural Experiment Station of the University of Nebraska further cooperated in the survey by helping with field inventory. Compilation of data was by the Lake States Forest Experiment Station.

Special acknowledgment is made to Karl Loerch, extension forester, Nebraska Agricultural Extension Service, for assistance in collecting data and for many useful suggestions.

Members of the Lake States Forest Experiment Station who assisted in planning the survey or collecting data are James T. Morgan, project supervisor; James Burton, forester (both of whom were with the Central States Forest Experiment Station during the early stage of the survey); A. L. Hartong, forester; and Miss Lake F. Compton, statistician.

Personnel from the Rocky Mountain Forest and Range Experiment Station who made important contributions to the project were Ralph A. Read, research center leader, Lincoln; and M. E. Becker, forest economist.

THE FOREST RESOURCE OF NEBRASKA

by

Robert N. Stone and Walter T. Bagley

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INTRODUCTION

Nebraska is a land of grass and grain. It spreads westward from the Missouri River, the eastern boundary, and extends out across the Missouri River Basin almost to the Rocky Mountains.

Expanses of level to rolling plains give Nebraska an appearance that is deceiving. Actually, the elevation rises at a rather constant rate of 8 to 10 feet per mile from east to west. Elevations climb above 5,300 feet in Kimball and Banner Counties in the west. Along the Missouri River, on the other hand, elevations of less than 1,000 feet are found. Variety is added to the landscape by river flats, canyons, bluffs, and hills. Some of the conditions formed by a varied topography permit tree growth, particularly on the moist north slopes and in the river bottoms.

Nebraska's variable climate confines the native forests to a limited range. The Nebraska climate is continental, with hot summers and cold winters. Spring is generally the wettest time of the year, with the highest rainfall occurring in May and June. The fall months are dry, with warm, pleasant days and cool nights. Rainfall varies widely from year to year; the State average ranges from 14 to 36 inches (fig. 1) (3). Extended droughts occasionally cause severe crop losses. Temperatures have ranged from a maximum of more than 110° F. to a minimum of -45°F. (3). Wind velocities average nearly 10 miles per hour, and are occasionally destructive, especially in the west. Violent hailstorms frequently cause severe local damage. However, hardy species will live on many areas not now forested.

Historically, the harvest from Nebraska's forests has been used locally. Early settlers cut nearby woods for fuel, building materials, and fence posts (4). Along the Missouri River cutters sold fuelwood to the early river boats. By 1860 the leading industry was sawmilling, which hired more than half of the labor and turned out more than half of the value of products for all industries. Timber cutters took the best trees of the more desirable species. This practice continues today. Present stands are largely made up of defective trees and low-value species.

The need for trees led to early tree-planting attempts, but was not reflected in the care the native stands received. Many stands have a long history of grazing and destructive cutting. Over the years the forested area has remained fairly stable with increases due to better protection from fire or other factors being offset by clearing for cropland. Heavy grazing has prevented the establishment of trees in some areas that would otherwise support tree cover.

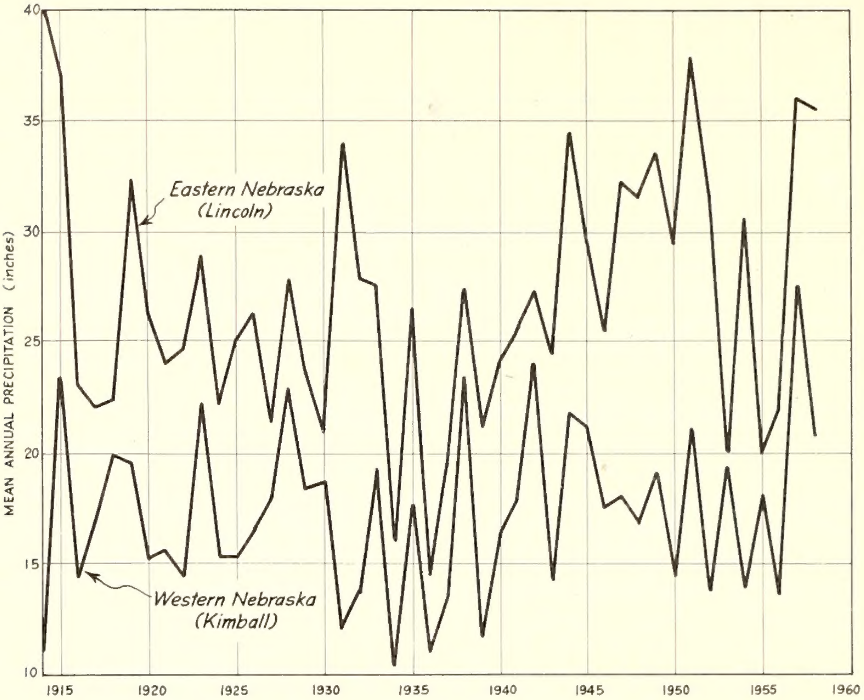


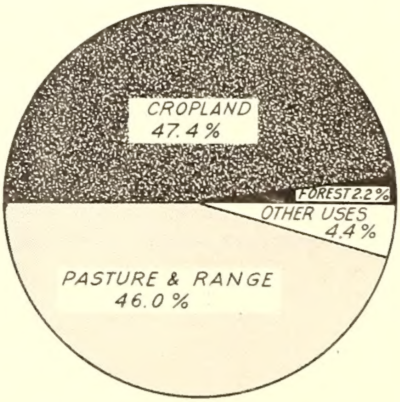
Figure 1.--A comparison of mean annual precipitation--eastern versus western Nebraska 1914-58 (12).

WHERE THE FORESTS ARE AND WHY

There are 1,072,600 acres of forest land scattered across Nebraska comprising 2.2 percent of the total land area (fig. 2). Generally, the native forests are found on the moister locations along streams and rivers and on the sheltered slopes (fig. 3). Nebraska is one of the few States having both eastern hardwoods and western softwoods within its boundaries.

Figure 2.--

Major land uses (13).



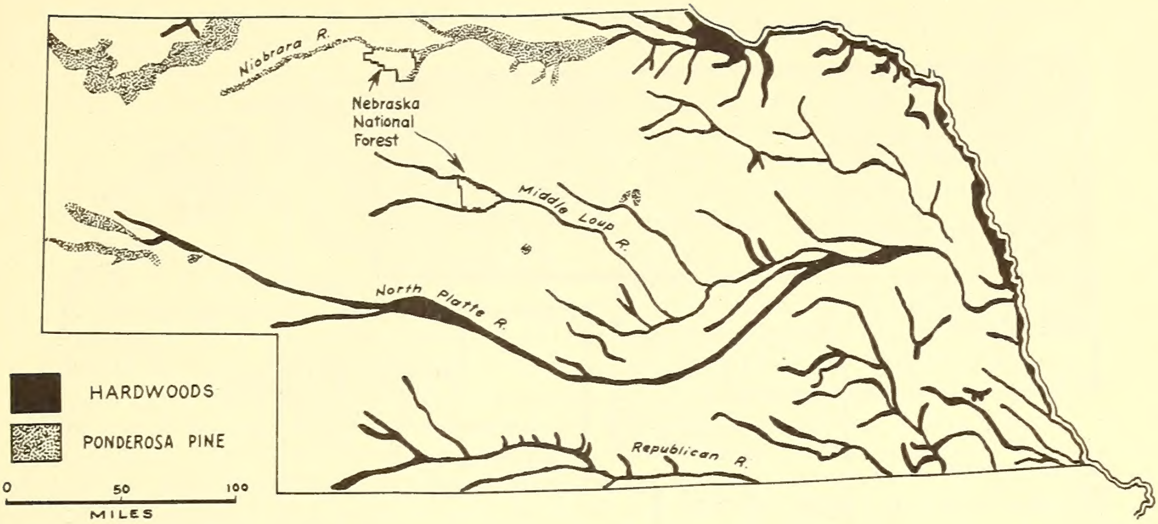


Figure 3.--Forest cover in Nebraska.

STREAMSIDE FORESTS COMMON

About 40 percent of the forest is bottomland, where elm, ash, and cottonwood predominate. These lowland forests flank the major rivers and streams, growing out from them on the flood plains and benches wherever moisture is adequate. Most of these forests are found in the eastern part of the State, along the Missouri, Niobrara, Loup, Platte, and Republican Rivers and their major tributaries. The lowland forests stretch up each drainage system in narrowing ribbons. Thus, while these valley forests total 403,000 acres, no large concentration is found in any area. Much of this forest type is found in the counties along the Missouri River (fig. 4).

PONDEROSA PINE THE MAJOR SOFTWOOD

Ponderosa pine grows on more than 258,000 acres in northwestern Nebraska. It is here that this timber type, the most drought-resistant commercial type in the west, makes its easternmost occurrence. As is common for a tree near the edge of its botanical range, ponderosa pine in Nebraska is often relatively short, of poor form, and limby. The largest concentration is in the Pine Ridge area in the northwestern corner of the State. A smaller concentration occurs south of Scotts Bluff. The remaining area of native ponderosa pine of commercial importance grows along the Niobrara River near the northern boundary. Here, western and eastern forest species meet and grow together. Outliers of ponderosa pine occur in Pines Canyon of Custer County and northwest of Burwell in Garfield County.

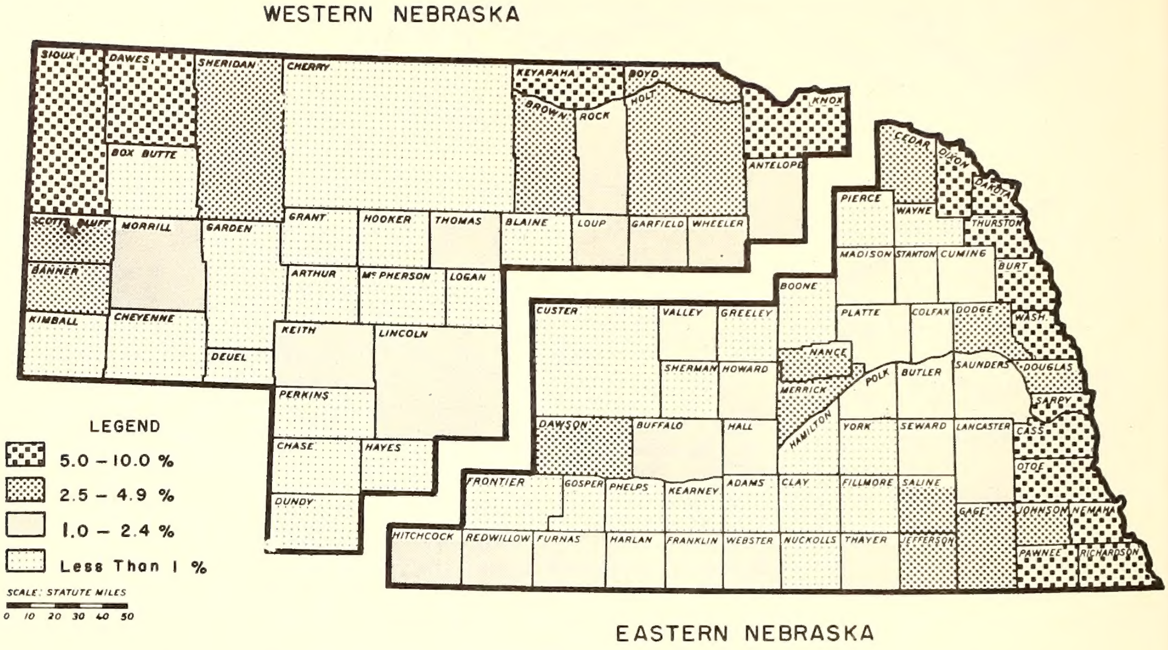


Figure 4.--Percentage of land forested by county in eastern and western Nebraska, 1955.

NEBRASKA HAS A LONG HISTORY OF TREE PLANTING

Nebraska was once known as "The Tree Planters' State." Over 300,000 acres have been planted, but the acreage of established effective plantings can only be estimated (11). Most of these have been windbreaks, established to provide protection to farmsteads, although many miles of field windbreaks provide cropland protection. Protection strips less than 120 feet wide are not considered forest land in this report. The value of trees in farmstead and livestock protection plantings is firmly established, but their place in the protection of cropland is yet to be determined.

TREE CULTURE ENCOURAGED BY PUBLIC ACTION

Tree planting has been encouraged by various acts of the State of Nebraska and the Federal Government. As early as 1869 Nebraska passed a tax exemption law favoring tree planting. On January 4, 1872, the State Board of Agriculture set aside April 10 for the planting of trees and named the day Arbor Day, the first such recognition in the United States. More than 1 million trees were planted the first Arbor Day. In March 1873, Congress passed the Timber Culture Act wherein settlers were offered 160 acres of land free if they would plant 40 (later reduced to 10) acres to trees and care for them for 10 years. This law was repealed in 1891, but many acres of "tree claims" had been planted. The establishment of the Nebraska National Forest in 1902 was the next milestone in tree planting, and it became a serious attempt to increase the forests of the State (1, 2). Two years later the Kincaid Act became law, providing free distribution of trees to farmers and ranchers west of the 100th meridian. The establishment of a forestry school at the University of Nebraska in 1902 undoubtedly stimulated interest in tree planting and forestry in general. It was discontinued in 1915. Enactment of the Clarke-McNary law in 1924 provided Federal assistance in furnishing landowners with tree planting stock. This law has effectively stimulated tree planting. During 1959 more than 1 million trees were distributed in Nebraska through the provisions of the Clarke-McNary law (11). Soil and Water Conservation Districts, and the Game, Forestation, and Parks Department also provide trees for protection plantings.

The severe drought of the 1930's--and the sand and dust storms that dramatically pointed it out--received nationwide attention. The drought ruthlessly illustrated the need for protective plantings and a widespread shelterbelt planting program was initiated. Known as the Prairie States Forestry Project, it sought to establish through cooperation with landowners planned systems of field windbreaks and to provide work for drought-stricken people throughout the Eastern Plains. Under this program more than 4,100 miles of field windbreaks were planted on 52,000 acres in Nebraska (fig. 5). In 1954, 86 percent of these windbreaks were found to be fair or better (6). Soil and Water Conservation District cooperators are encouraged to plant trees as a part of the soil conservation plan prepared by the U. S. Soil Conservation Service. Further encouragement has been provided by the Agricultural Conservation Program of the Agricultural Stabilization and Conservation office which shares the cost of tree planting with the landowner under certain conditions, and the Conservation Reserve of the Soil Bank program.

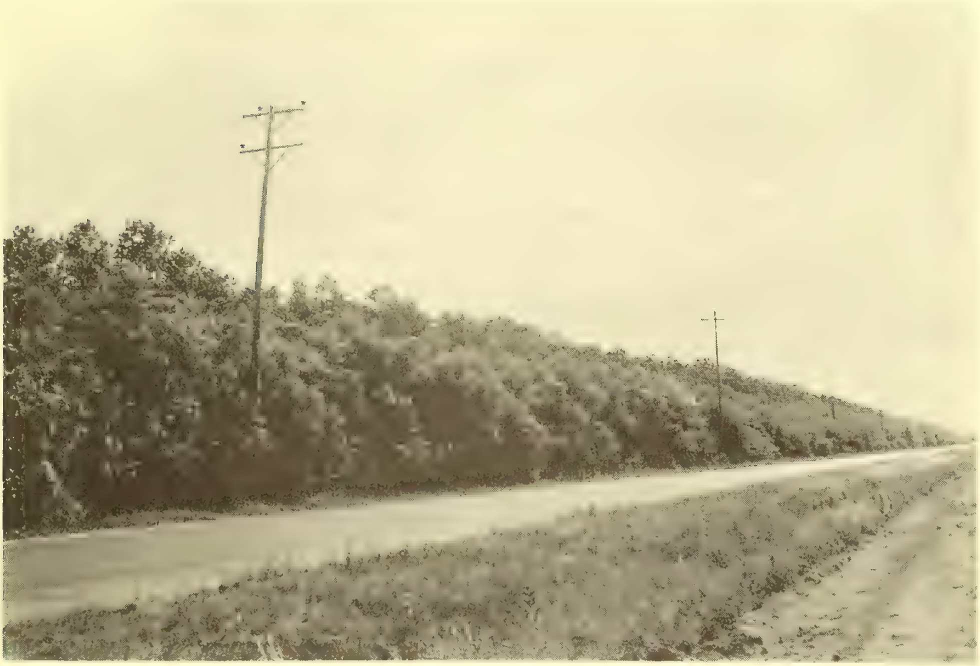


Figure 5.--Many thousands of acres of plantings protect Nebraska farmsteads and cropland from the winds.

The Nebraska National Forest was established in the sandhills. Two separate areas were set up: "Dismal River Forest Reserve," lying between Middle Loup River and the Dismal River in Thomas County west of Halsey, and the "Niobrara Forest Reserve" lying between the Niobrara and Snake rivers in north-central Cherry County (5). The two are now known as the Bessey and Niobrara Ranger Districts. This is the only manmade national forest in the country, for all of the trees on the area have been planted. The Nebraska National Forest contains 206,000 acres, 96,000 in the Bessey and 110,000 in the Niobrara districts. About 30,000 acres of plantings are established on this national forest (11).

FOREST RESOURCES

FOREST AREA LIMITED

In 1955 the forest land in Nebraska amounted to 1,072,600 acres,[2] which is 2.2 percent of the total land area. Of this acreage, 1,050,400 acres is commercial forest land. For sampling purposes the State was divided into eastern and western divisions for the inventory (see fig. 4). The commercial forest area is about equally distributed in the two divisions (table 1).[3]

In addition to commercial forest land, tree cover in windbreaks and native strips too narrow to be classed as forest area total 413,000 acres.

Farmers and ranchers own 78 percent of Nebraska's commercial forest land, and other private landholders control another 13 percent. Most windbreak plantings and native tree strips are also on farms and ranches. Publicly owned commercial forest land makes up 9 percent of the total.

STAND SIZE

Sawtimber occupies one-fourth of all commercial timberland (fig. 6). About 30 percent of the commercial forest is classed as poletimber, which is well distributed among the various types. Seedling and sapling stands total only 10 percent; nonstocked acreage is high--nearly 35 percent of the total commercial forests.

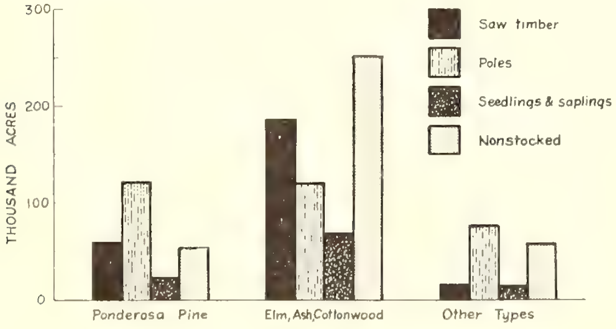


Figure 6.--Area of commercial forest by forest type and stand-size class.

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[2] The Timber Resource Review figure of 1,480,000 acres in 1953 was an estimate and should be discarded in favor of the areas shown in this report.

[3] All tables are grouped in a separate section following appendix.

About 20 of Nebraska's tree species are commercially important. The different species mingle in many associations. For inventory purposes, the forest stands were grouped into five major types based on the predominating species (fig. 7).

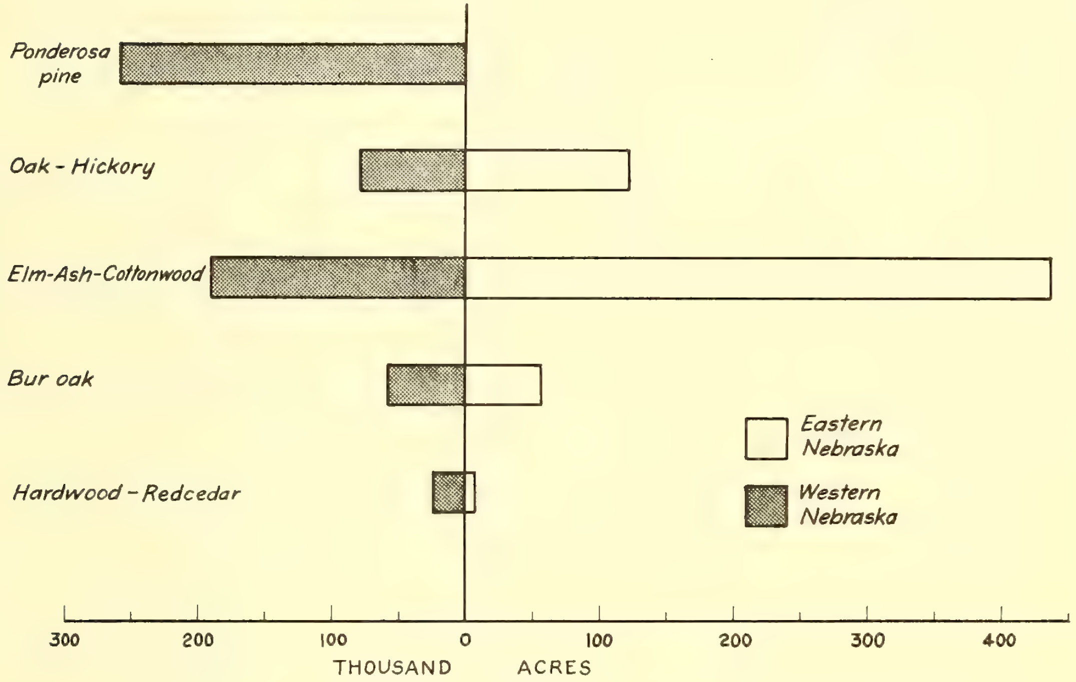

Figure 7.--Area of commercial forest land by forest type, Nebraska, 1955.

Elm-Ash-Cottonwood

Sixty percent of Nebraska's forest land is in the elm-ash-cottonwood type, which contains 71 percent of the sawtimber volume (1,024 million board feet) (fig. 8). The type varies widely in species composition, quality, and form. It contains the largest trees in the State along with some of the most defective. The elm-ash-cottonwood type grows most commonly on moist bottomlands where it makes its best development. Eastern cottonwood is the most representative species. Cottonwood is a pioneer species, becoming established before other species on newly deposited sandbars and streambanks, often in nearly pure stands. It is gradually replaced by green and white ash, American and slippery elm, and several other species. This situation results in stands of varied species composition and age classes. In addition to its timber volume, the type has watershed-protection value.

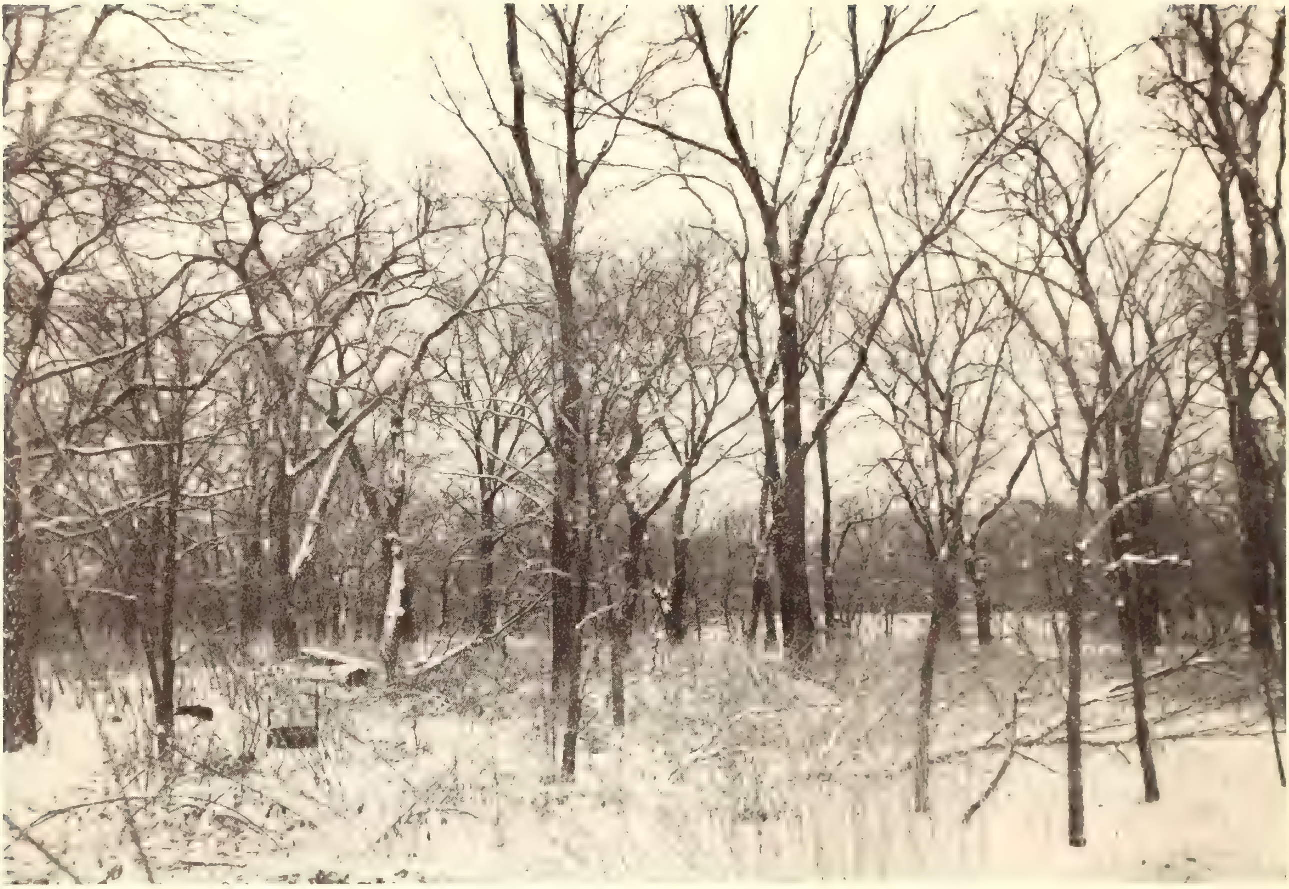

Figure 8.--Sixty percent of Nebraska's forests are elm-ash-cottonwood.

Ponderosa Pine

The ponderosa pine type is the major softwood type in Nebraska. It occupies 258,000 acres in western Nebraska and contains one-fifth of the live sawtimber volume (296 million board feet) found in the State. Ponderosa pine generally grows in pure stands, although it occasionally associates with several other species. It is the most drought resistant of the true timber types of North America (7). The ponderosa pine type is a climax type, and where it is destroyed, grass and shrubby vegetation come in. Ponderosa pine stands are open, with scattered trees often in small clumps (fig. 9). Many are short and limby. Fire scars are common on the larger trees.

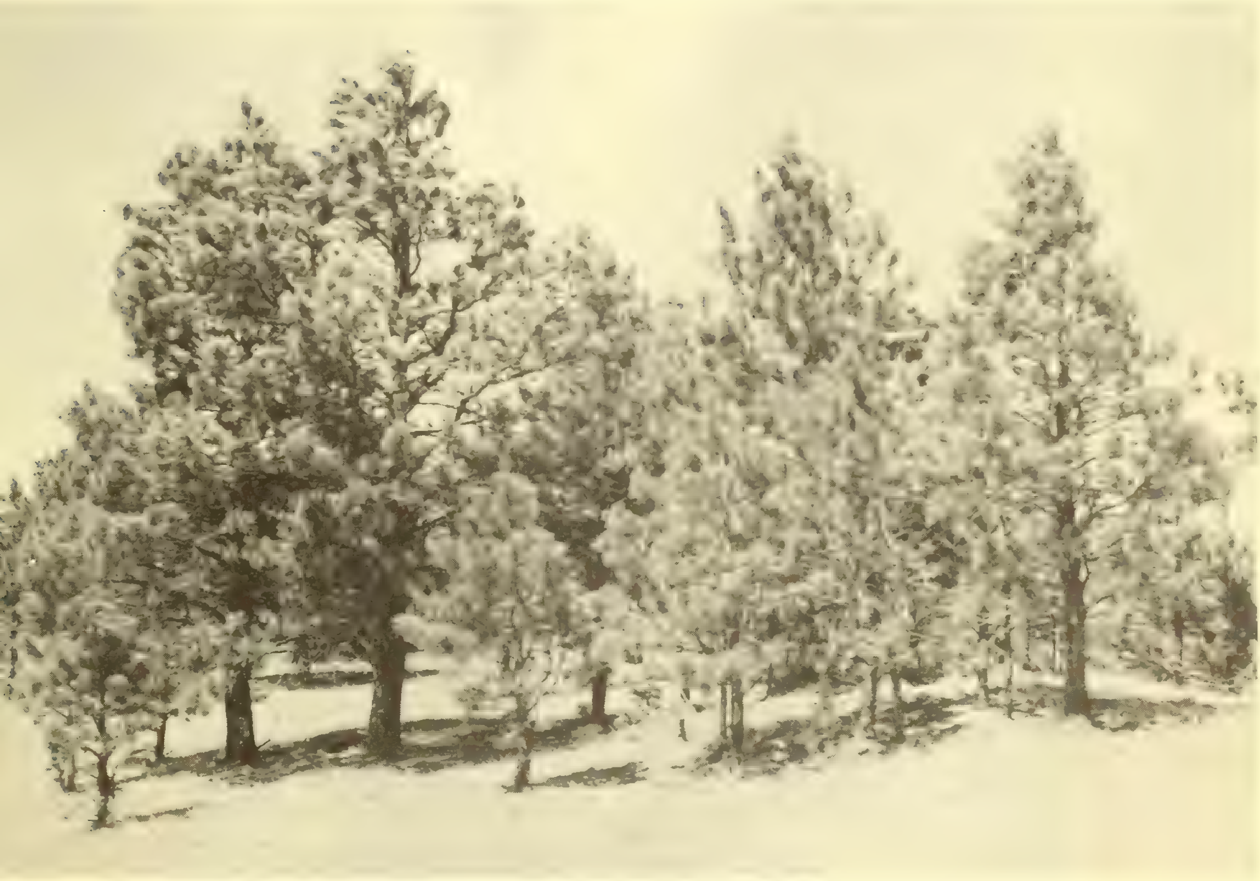

Figure 9.--Ponderosa pine in Nebraska is often short and limby.

Bur Oak

The bur oak type is widely scattered in Nebraska and occupies 114,000 acres (fig. 10). The type is most often found on dry, exposed slopes in eastern Nebraska but has better development on more moist situations. A pioneer species, bur oak often grows in nearly pure stands, but on better sites other oaks and hickories gradually crowd it out. In harsh exposed situations bur oak dwindles in size to a small brushy shrub. It is poor in growth, form, and size on many Nebraska sites.

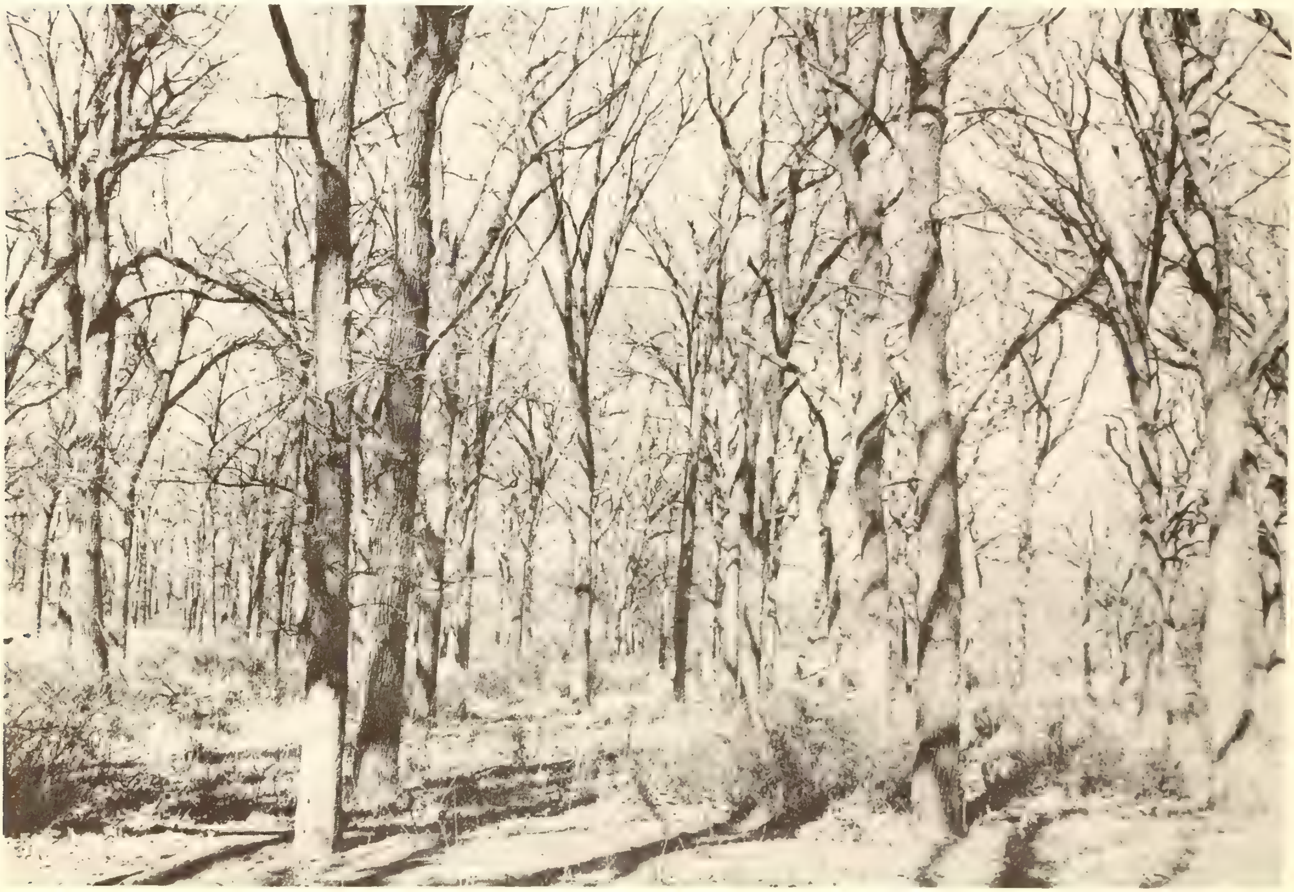

Figure 10.--Bur oak is common on dry exposed slopes in eastern Nebraska.

Twenty thousand acres in Nebraska are broadly classed in the oak-hickory type (fig. 11). These stands contain 35 million board feet of sawtimber. This hardwood association seldom has a dominant species. The type includes a number of hardwood species (several oaks and hickories, hackberry, black cherry, American elm, and slippery elm) and varies in composition, depending on the site. It ranges from slopes nearly as dry as those occupied by the bur oak type to the bottomlands more commonly covered with elm-ash-cottonwood stands. It makes its best development on moist rich soils near bottomland sites along the Missouri River bluffs.

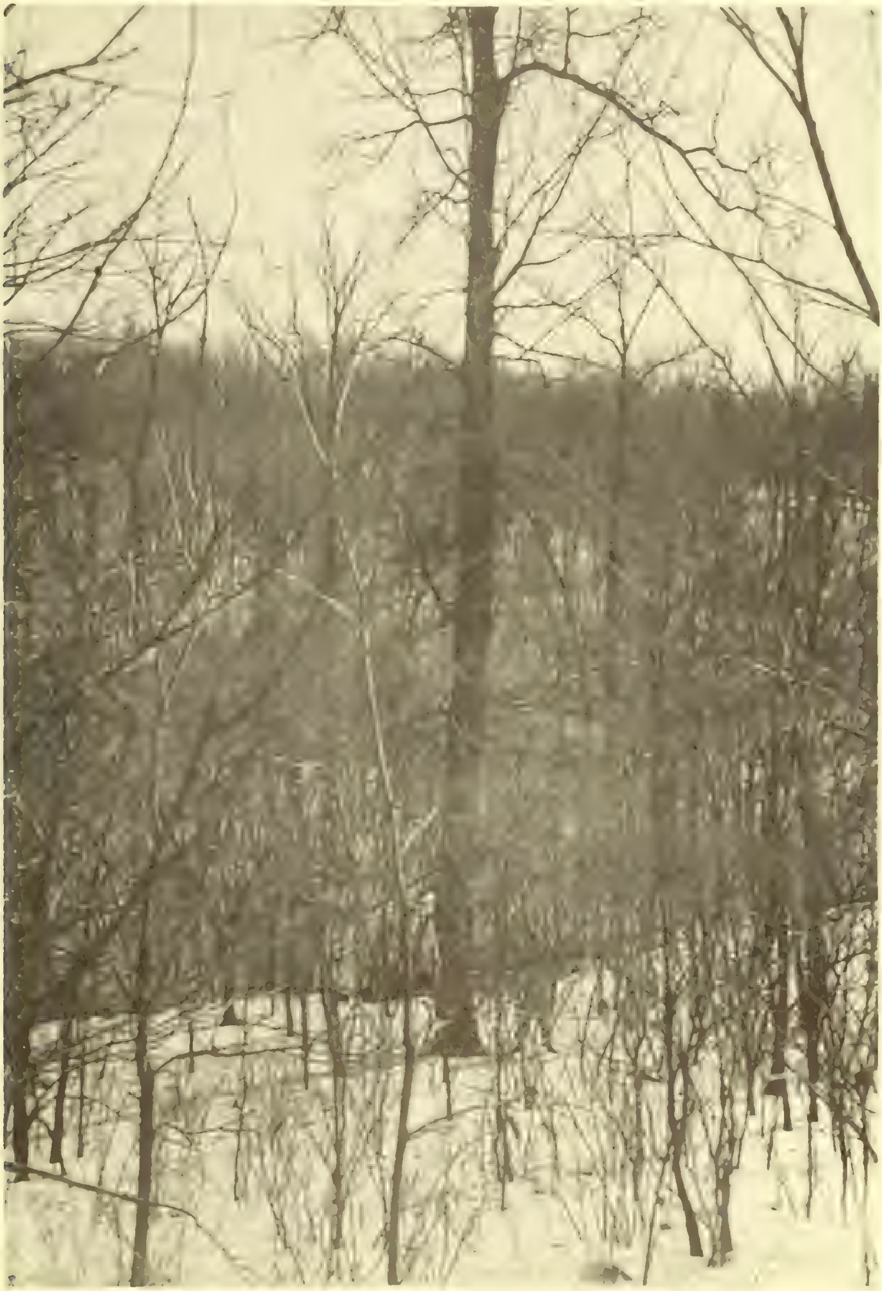

Figure 11.--Oak-hickory stand.

Hardwood-Redcedar

The hardwood-redcedar type occupies 2.9 percent of Nebraska's commercial forest land (30,000 acres). This type most commonly consists of stands of scattered small trees with little commercial volume (fig. 12). Eastern redcedar is found as an understory in some heavily grazed hardwood stands. Included in the type are some eastern redcedar plantations on the Nebraska National Forest and scattered planting elsewhere. Rocky Mountain juniper growing in scattered poor stands in the extreme western part of the State is included, although most of the softwood volume in the type is eastern redcedar. The net volume of sawtimber in the hardwood-redcedar type is only 4.9 million board feet.

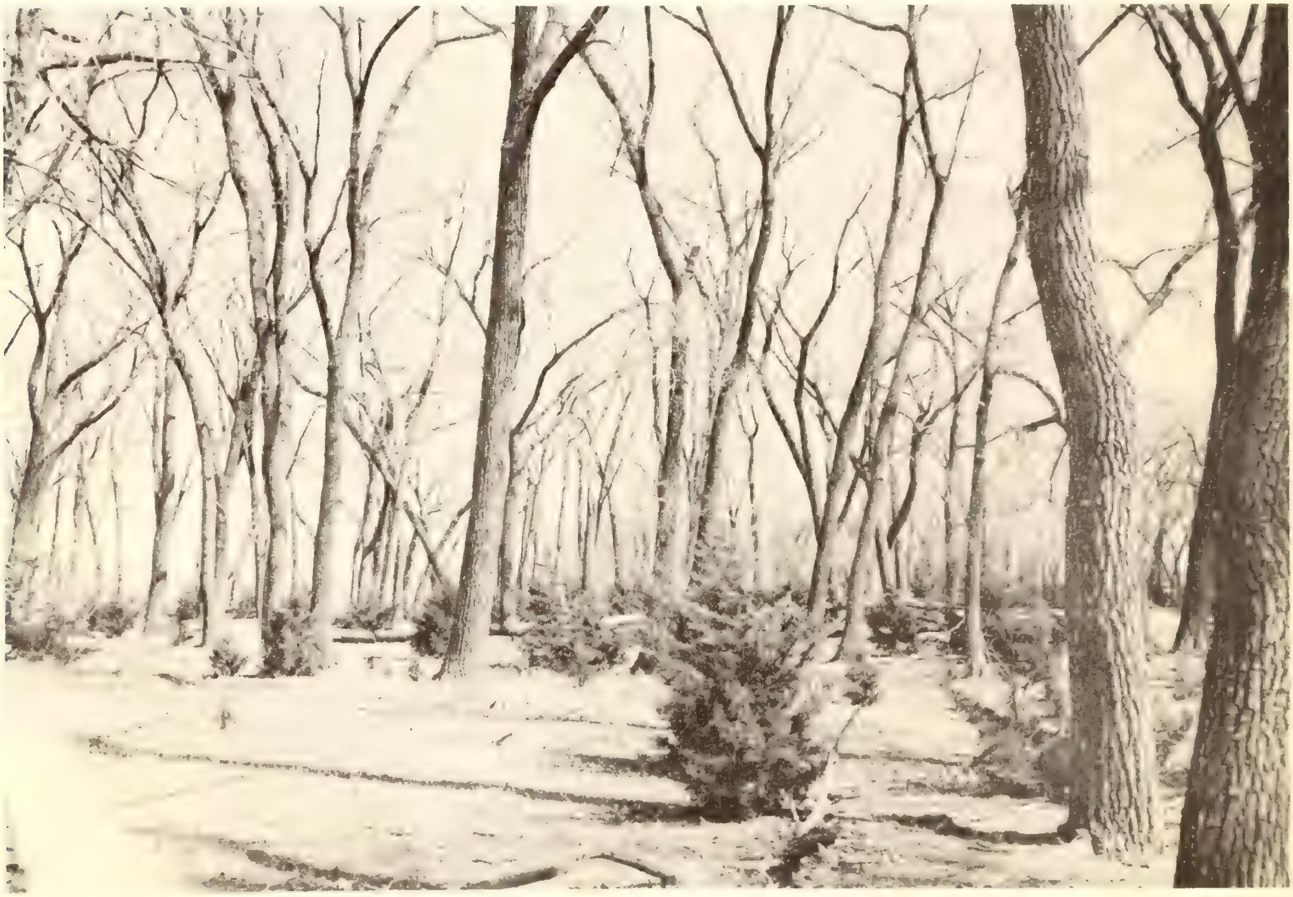

Figure 12.--Hardwood-redcedar type.

POOR STOCKING PREVALENT

Thirty-five percent of the commercial forest land is nonstocked. Stands classed as poorly stocked and nonstocked occupy 607,000 acres. Medium-stocked stands occur on 275,000 acres; and well-stocked stands, on 168,000 acres (fig. 13). Stocking classes are defined in the appendix. More favorable stocking exists in the sawtimber stands, where 38 percent are well stocked and another 42 percent are classed as fair. When only sawtimber trees are considered, these percentages drop because much of the volume found in sawtimber stands is of poletimber size.

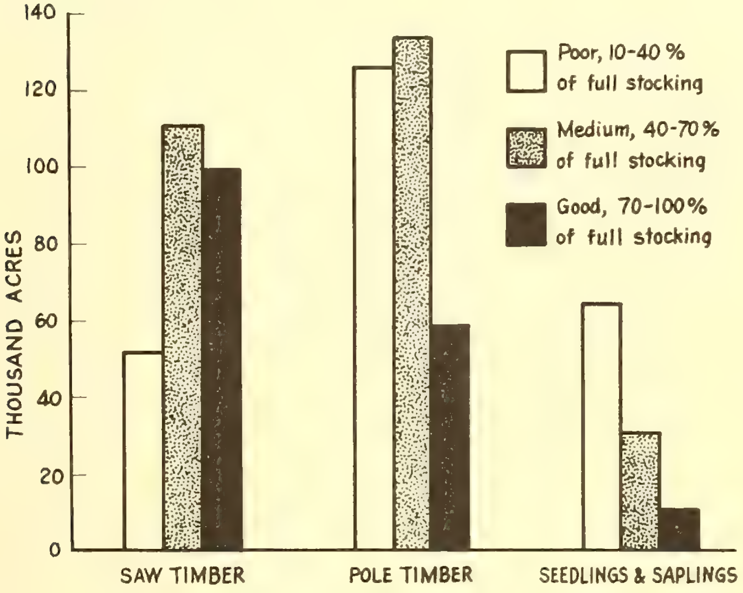

Figure 13.--Forest area by stand size and stocking classes, Nebraska, 1955. (Includes all growing stock in stands.)

Forty-two percent of the poletimber stands are classed as medium, 39 percent as poor, and only 19 percent as well stocked. More than 61 percent of the seedling and sapling stands are poorly stocked.

MAJORITY OF SITES CAN GROW 2-LOG TREES

The quality of forest sites in Nebraska was rated on the basis of the number of 16-foot logs produced in mature trees on the various sites. Eight percent or 84,000 acres of the State's commercial forests will grow trees with 3 to $3\frac{1}{2}$ logs at maturity. About 45 percent or 473,000 acres of the area will grow 2 to $2\frac{1}{2}$ logs, and the remaining 47 percent are poor sites, producing only 1- to $1\frac{1}{2}$-log trees. However, these estimates are conservative, since many of the trees measured to determine site quality have had adverse treatment.

Several relationships between site quality and stand conditions were discovered. Sites in eastern Nebraska were somewhat better than in western Nebraska. Most sawtimber stands are growing on better sites than the poletimber stands. More than 70 percent of the nonstocked area was estimated to have poor site quality, and no nonstocked areas were rated good or excellent.

VOLUME IS LARGELY IN SAWTIMBER

The estimated sound volume of all live timber on commercial forest land in Nebraska in 1955 was 568.2 million cubic feet (table 10). Of the total volume, 40 percent is in saw logs, 11 percent is in usable upper stems, 15 percent is in pole timber, and 34 percent is in cull trees and hardwood limbs (fig. 14). The volume in cull trees and hardwood limbs presently has only limited use for fuelwood and similar low-value products and is considered unmerchantable.

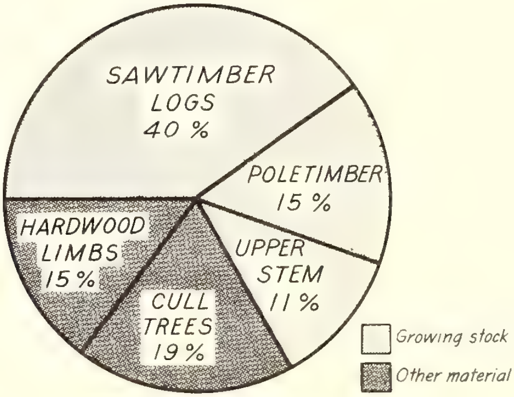

Figure 14.--Volume of sound material in living trees, Nebraska, 1955.

Growing stock volume including saw logs, poletimber, and usable upper stems of sawtimber trees totals 377.1 million cubic feet,[4] an average of 4.5 cords per acre of commercial forest land (table 13). Sawtimber volume in sawtimber-sized stands averages 4,300 board feet per acre. Softwood species make up 21 percent of the growing stock, and hardwood species account for 79 percent (fig. 15). Salvable dead trees total 4.4 million cubic feet of which 4.2 million cubic feet are hardwoods.

The estimated volume of saw logs on commercial forest land in Nebraska in 1955 was 1,437 million board feet.[4] Saw log volume is fairly well distributed in the various diameters, with 31 percent in trees having diameter of 10 to 14 inches, 39 percent in trees of 16 to 20 inches, and 30 percent in those larger than 22 inches. Five species contain 91 percent of the saw log volume. In order of volume they are: cottonwood, ponderosa pine, elm, ash, and bur oak. Most of the sawtimber volume is in eastern Nebraska--nearly 65 percent. However, all of the softwood sawtimber volume except for 1.3 million board feet of eastern redcedar is in western Nebraska. Some 81 percent of the sawtimber volume is in farm woods. Another 10 percent is owned by other private owners.

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[4] Timber Resource Review estimates made in 1953 were 462 million cubic feet of growing stock and 1,253 million board feet of sawtimber. These estimates should be discarded in favor of figures given in this report.

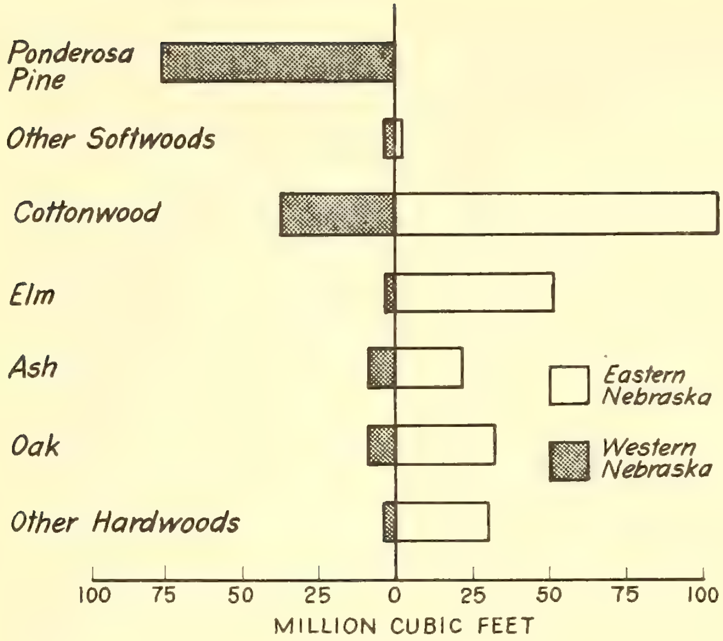


Figure 15.--Volume of growing stock by species, Nebraska, 1955.

MUCH OF SAWTIMBER IS POOR QUALITY

Nebraska is on the western fringe of the eastern forest types and on the eastern edge of the western types. Trees on the extremities of their range are generally shorter, limbier, and of poorer form than those well within the range. This along with the cutting of higher quality trees has left most of Nebraska's stands with poor quality sawtimber (fig. 16). Nearly 60 percent of the merchantable sawtimber is in grade 3 logs, mainly suitable for manufacture into ties, box and crate material, pallets, dunnage, timbers, and rough lumber. Log grades 1 and 2 suitable for sawing into standard lumber and other more specialized uses, make up the remaining 40 percent of the volume. Cottonwood contains the highest percentage of high grade logs, with 51 percent in grades 1 and 2 (fig. 17).

GROWTH EQUALS ABOUT 4 PERCENT OF VOLUME

Estimated net annual growth in 1955 was 14.0 million cubic feet. Ingrowth, the total volume of trees reaching 5 inches in diameter during the year, accounted for only 11 percent. Net annual growth was 3.7 percent of growing stock volume. Sawtimber had a net annual growth of 68.8 million board feet, about 4.8 percent of the sawtimber volume.

Average annual growth amounts to 13 cubic feet per acre on growing stock including 66 board feet per acre on sawtimber trees. When nonstocked area is excluded it is 20 cubic feet per acre, including 100 board feet on sawtimber trees. Cottonwood (47 percent) and ponderosa pine (20 percent) accounted for two-thirds of the total net annual growth.

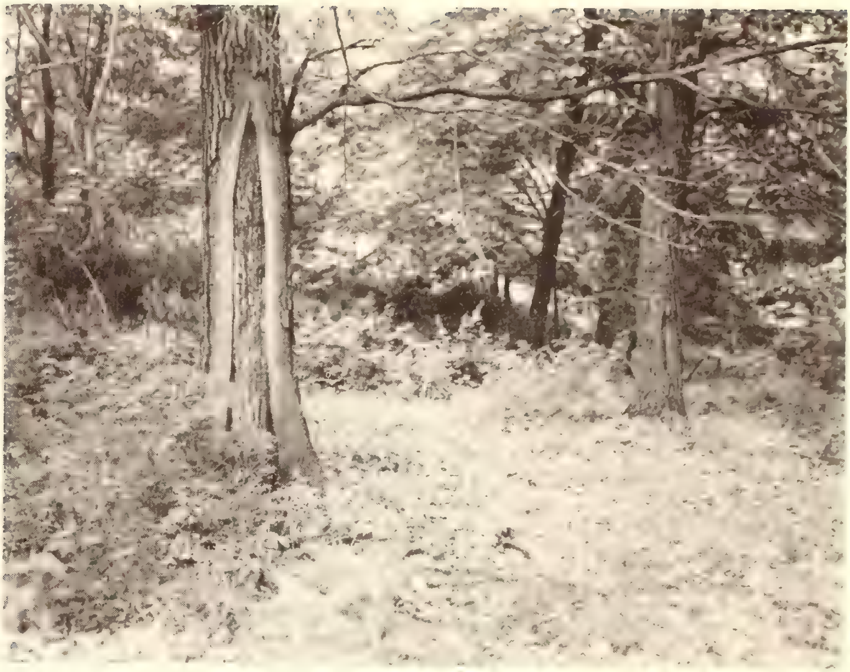


Figure 16.--Hardwood stands contain 22.9 million cubic feet of culls such as this defective red oak (table 10).

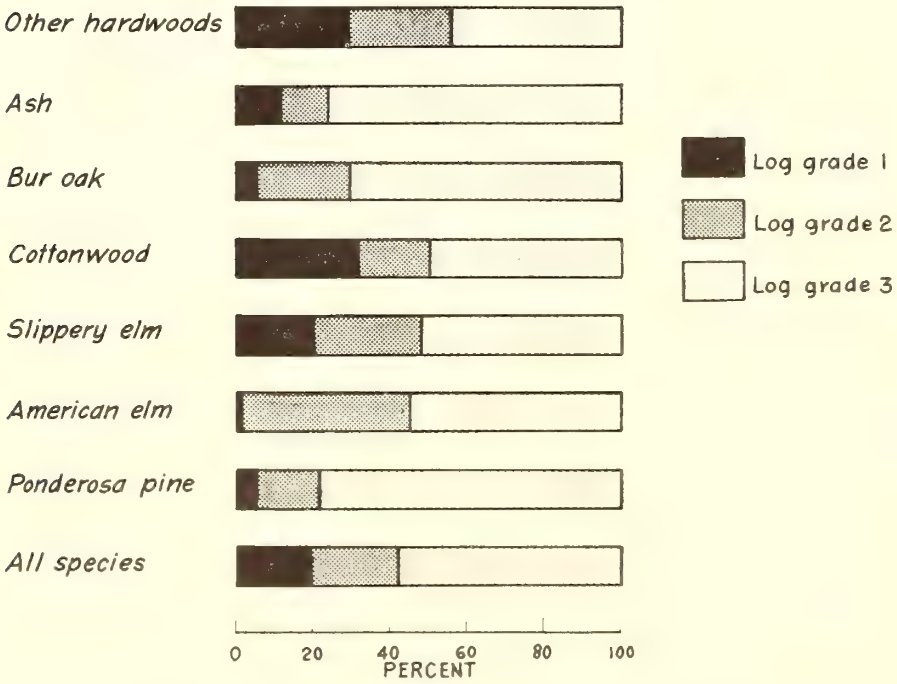


Figure 17.--Saw log grades by species, Nebraska, 1955.

Growth in the better stocked stands is considerably higher than the average for all forest land. Ponderosa pine stands classed as small sawtimber are growing 100 board feet per acre and large sawtimber stands have growth estimated at 90 board feet per acre. The elm-ash-cottonwood type is growing faster. Small sawtimber stands of elm-ash-cottonwood have an estimated annual growth of 225 board feet; for large sawtimber annual growth is 160 board feet per year.

The value of growth is closely related to the quality of trees on which it occurs. Since 60 percent of Nebraska's sawtimber contains low quality No. 3 logs much of the growth is accumulating on trees of low value.

MORTALITY RATE LOW

An average of 1.5 million cubic feet of merchantable timber is killed each year in Nebraska by fire, wind, insects, disease, and miscellaneous natural causes. This loss includes 5.8 million board feet of sawtimber. The annual mortality equals 0.4 percent of the total growing stock volume and the same percentage of sawtimber volume. It equals 11 percent of the annual growth of all growing stock.

Fire destroys little timber volume in Nebraska. Although an average of about 40 forest fires occur each year, the acreage burned is small. Forest diseases account for about 20 percent of tree mortality. Other causes of loss are difficult to determine.

HEAVY GRAZING DAMAGES FORESTS

Grazing of forest land is widespread in Nebraska. About 45 percent of the forest area is classed as heavily grazed. Continued heavy grazing will result in the elimination of forest cover on this area. Damage from grazing is gradual, but as it accumulates over the years a marked deterioration of the forest results.

Comparison of stocking in heavily grazed stands against those lightly grazed shows the general effects of grazing. Of the stands found to be poorly stocked, 49 percent were heavily grazed compared with 8 percent of the stands with good stocking levels (fig. 18). This general trend was found for all stand sizes. It seems apparent therefore that the large proportion of poorly stocked and nonstocked commercial forest land is the direct result of woodland grazing. Lack of reproduction is the most striking symptom of overgrazing. Young trees are rare, making overgrazed stands open and parklike with a distinct browse line (fig. 19). Even where some reproduction survives, it is mainly the less desirable timber species, since the best species are often the most palatable to livestock. Grazing in the ponderosa pine type is common in the West where loss of timber can be slight when grazed properly. The hardwoods types are easily damaged by grazing, and even light grazing adversely affects stand quality, composition, and productivity.

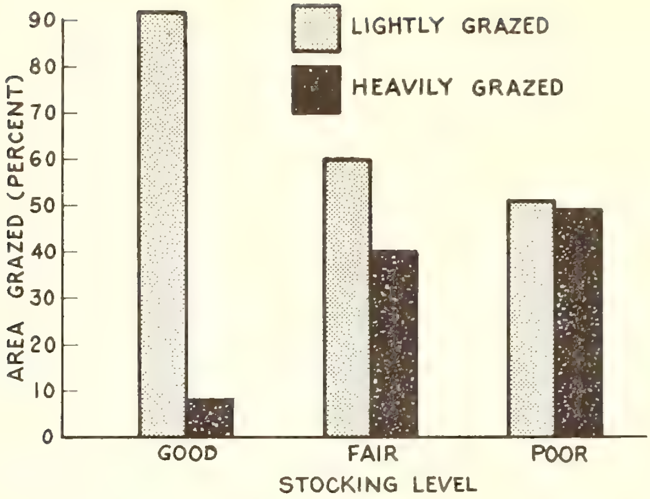


Figure 18.--Relationship of grazing intensity and stocking level.

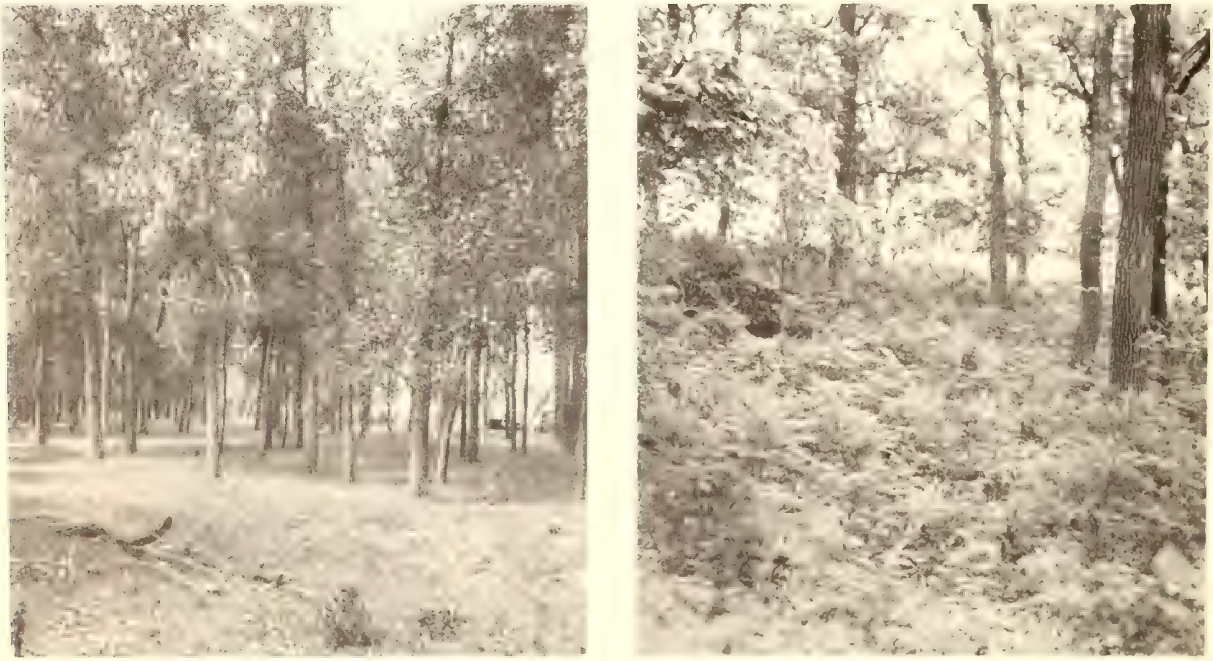


Figure 19.--A heavily grazed area appears open and parklike in comparison with an ungrazed stand.

WOOD-USING INDUSTRIES EMPLOY 1,100 PERSONS

Nebraska, with just over 1 million acres of forest land, in widely scattered and often sparse tracts, does not suggest any large wood-using industries. Nevertheless, the lumber and wood-products industry in 1954 had 1,126 employees, of which 742 were engaged in secondary production such as millwork and container manufacturing (9). In 1954 the total payroll for this industry was $3.5 million.

In 1953 there were 286 sawmills in the State, although only 188 were active during the year (fig. 20). Mills in Kansas and Iowa produced veneer from walnut logs cut in Nebraska. During 1953, 8,197,000 board feet of saw logs were harvested. More than 500,000 fence posts were cut the same year, along with 65,000 cords of fuelwood.

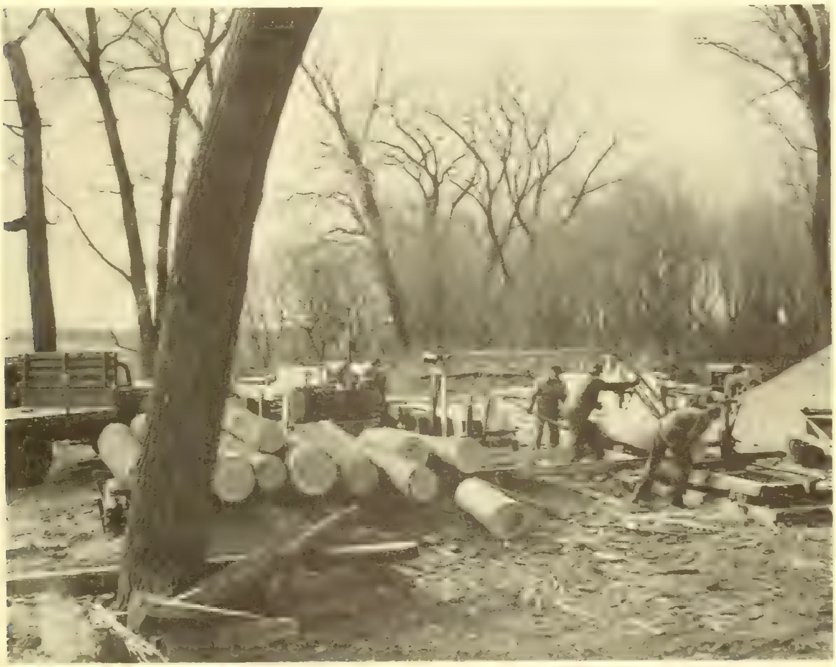


Figure 20.--Much of the lumber produced in Nebraska is sawn on small semi-portable mills like this one in Madison County.

TIMBER USE OF LOCAL IMPORTANCE

Most of the wood-using industry harvesting homegrown wood is small and of only local importance. It is made up of the farmer who cuts a few fenceposts and some firewood when he has time, and the part-time sawmill operator who buys a few logs from his neighbors and saws them into boards whenever a customer wants to build a barn or shed. The forests of the State produce an important part of local wood requirements--wood that would have to be shipped many miles at considerable expense if it could not be cut from the native forests.

LARGER TIMBER CUT NEEDED

A special survey was conducted in 1953 to determine the production of wood products from Nebraska timber. This includes the harvest of Nebraska timber only, excluding imports.

The total cut in 1953 amounted to approximately 4 million cubic feet, including 18.2 million board feet of sawtimber (table 16). Ninety-eight percent of all the wood harvested came from hardwood species. The sawtimber cut also was found to be 98 percent hardwoods.

Of the total sawtimber cut, 45 percent was cut into saw logs (fig. 21). Another 44 percent, mainly from low-quality trees, was used for fuelwood. The remaining 11 percent went into fenceposts, veneer logs, and farm timbers. Cottonwood dominated the sawtimber cut, with 37 percent of the total, followed by oak with 22 percent (fig. 22).

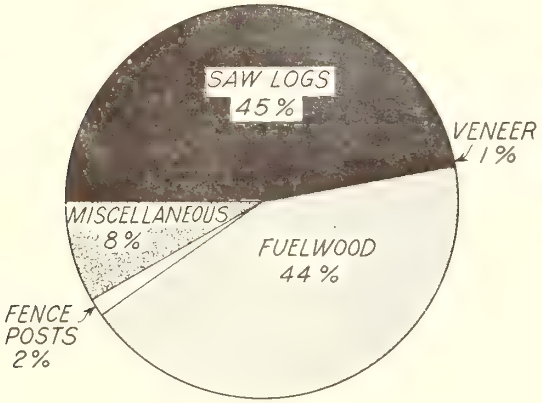


Figure 21.--
Products cut from trees of sawtimber size, Nebraska, 1953.

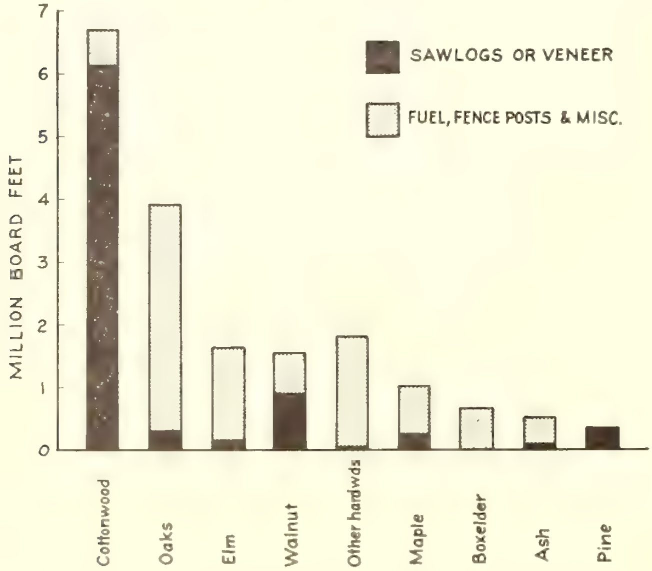
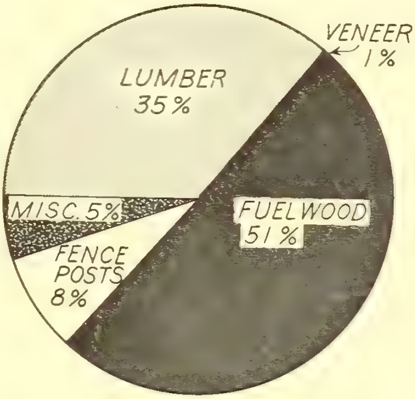


Figure 22.--Products cut from sawtimber trees by species and products, Nebraska, 1953.

Half of the growing stock cut was used for fuelwood (fig. 23). For comparison nationwide in 1952, 18 percent of the total timber cut went into fuelwood (10). In 1953, 35 percent of the timber harvested was used for lumber logs, 8 percent for fenceposts, with the remainder used for veneer and miscellaneous farm timbers.

Figure 23.--
Products cut from
trees of all sizes,
Nebraska, 1953.



The timber cut was found to be unequally distributed geographically. Eastern Nebraska with 62 percent of the total volume had four-fifths of the total timber cut. The overall cut in western Nebraska is low, for there is very little cutting of ponderosa pine, the major species there. The geographic distribution of timber harvest is closely correlated with population, which is typical of areas where most of the wood is used locally in low-value products.

GROWING STOCK

Current net growth of Nebraska's growing stock is more than three times the annual cut. Growth of sawtimber exceeds by nearly four times the annual cut (fig. 24; table 17). With net growth on commercial forest land of 14.0 million cubic feet and timber cut of 4.0 million cubic feet, the total growing stock is accruing by about 10 million feet annually. The greatest increase in volume is in two species--ponderosa pine and cottonwood. Yet cottonwood cutting equals only 19 percent of its net annual sawtimber growth; ponderosa pine is still lower with 2.5 percent (fig. 25).

If timber cutting remains at the present level a definite buildup of growing stock will continue. Projection of current trends indicates that in 30 years the growing stock might increase by about two-thirds and sawtimber supplies might double (table 35).

On the other hand, the quality of timber supplies is decreasing. Sawtimber sizes of such valuable hardwoods as walnut are being overcut. In 1953, for example, the cut of walnut was more than double the growth; whereas the cut of cottonwood--the most abundant but one of the less valuable species--was only about one-fifth of the growth.

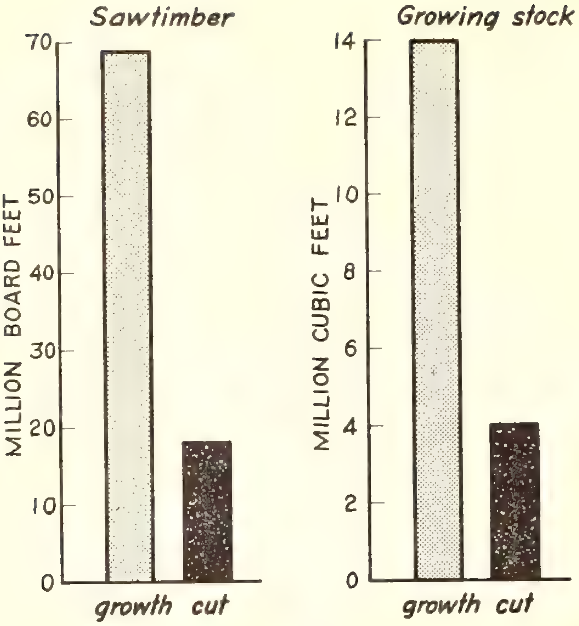


Figure 24.--A comparison of net timber growth and cut.

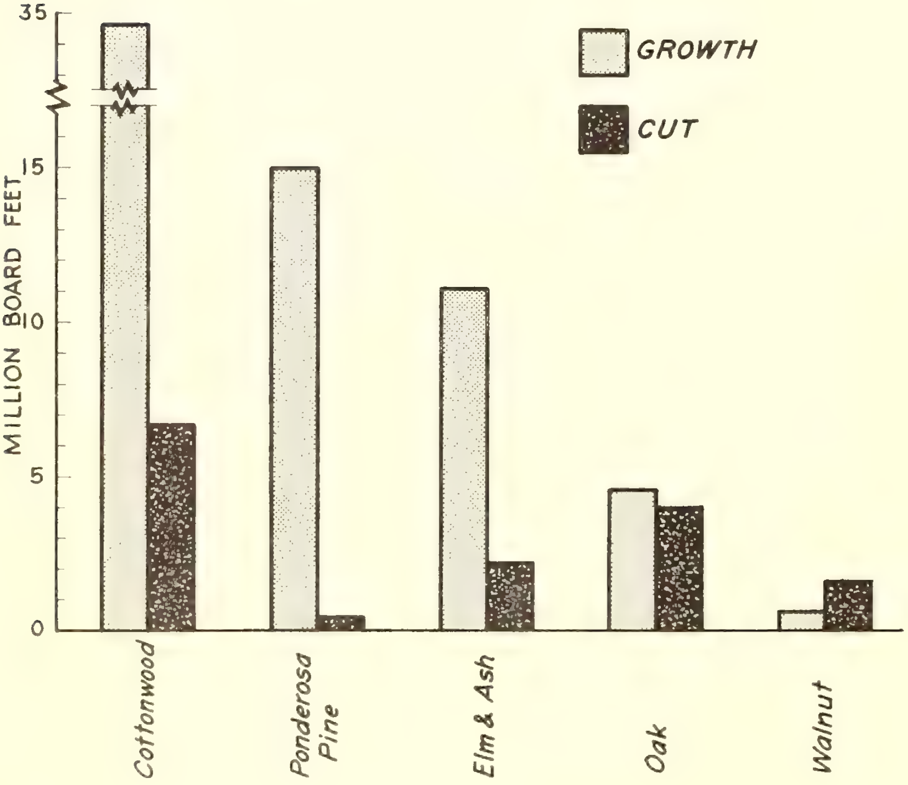


Figure 25.--Net growth and cut of sawtimber by selected species.

FUTURE OF NEBRASKA'S TIMBER RESOURCE

By 1985 Nebraska's forests will be better stocked and have higher net annual growth according to 30-year projections (table 35). Estimated sawtimber volume in 1985 will be double the 1955 volume. Net annual growth of sawtimber is expected to be only one-fifth higher. Changes in growth are not expected to keep up with improvements in volume due to anticipated increases in mortality. The projected expansion of one-third in the rate of saw log cutting will not be large enough to prevent increasing cull increment and mortality in overmature and low-quality sawtimber trees, particularly cottonwood. An anticipated gradual reduction in fuelwood demand will tend to reduce cutting of trees of little value except for fuelwood. Many of these will be left to deteriorate and, therefore, raise the rate of mortality. This will retard improvements in net annual growth. Nevertheless, these improvements in timber volume and net annual growth can provide a larger timber cut. These estimates are based on projections of current trends and thus, are inherently speculative. However, if problems needing attention in Nebraska's forests are solved, these predictions will be low.

The major problems affecting the timber resource have been touched on earlier in the report and include: heavy grazing of half of the forest land, "high grade" cutting without regard for the residual stand, general neglect of the woodlands, and the large acreage of nonstocked forest land (fig. 26).

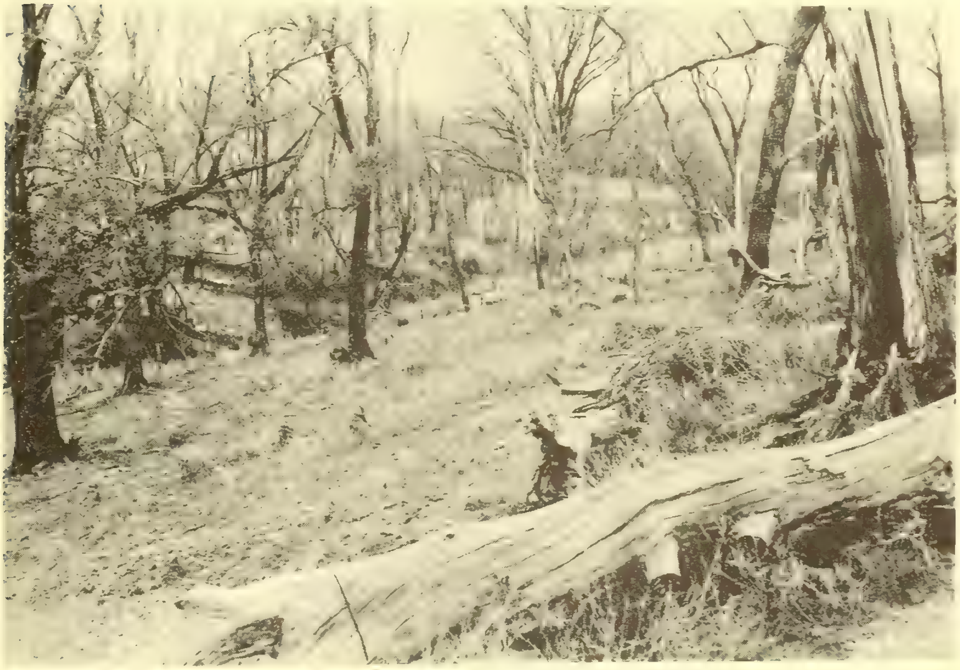


Figure 26.--Understocked stand near Fort Calhoun, Nebraska. The State has 365,000 acres of commercial forest land classed as nonstocked.

In an effort to improve forestry practices in Nebraska, State and Federal agencies are bringing education and assistance to private forest owners. The State forester (stationed at the University of Nebraska in Lincoln) has the major responsibility for advising woodland owners on management problems. His staff includes three men stationed at Lincoln, Grand Island, and Pierce. Foresters of the U.S. Forest Service and woodland conservationists of the U. S. Soil Conservation Service can offer advice upon request. The costs of some forest-improvement practices are shared by the Federal Government under the Agricultural Conservation Program (ACP).

Past forestry research in Nebraska has been directed mainly at tree planting and windbreak establishment problems. Future timber yields depend on efforts made to expand markets for low-quality timber, to determine practical management techniques for the types common in the State, to develop methods for obtaining natural reproduction of desirable species on nonstocked areas, and to determine the costs and the benefits that can be expected from forest lands.

Forests yield many benefits besides wood products. A deck of logs or a pile of fenceposts or fuelwood can be easily visualized. Their value can be exactly determined. But the worth of a forest in harboring wildlife, stabilizing stream banks and slopes, making the landscape more attractive, modifying the local climate, or providing hunting, camping, and other outdoor recreation is difficult to measure in dollars. All these benefits from the forest resource occur in Nebraska. The multiple worth of all the products of their timber resource enriches the lives of Nebraska's citizens.

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TREE SPECIES

SOFTWOODS:

Juniper	Eastern redcedar	Juniperus virginiana
	Rocky Mountain juniper	J. scopulorum
Pine	Austrian pine	Pinus nigra
	Jack pine	P. banksiana
	Limber pine	P. flexilis
	Ponderosa pine	P. ponderosa
	Red pine	P. resinosa
	Scotch pine	P. sylvestris

HARDWOODS:

Ash	Green ash	Fraxinus pennsylvanica
	White ash	F. americana
Aspen	Balsam poplar	Populus balsamifera
	Quaking aspen	P. tremuloides
Basswood		Tilia spp.
Birch		Betula spp.
Catalpa		Catalpa spp.
Cherry, black		Prunus serotina
Cottonwood	Eastern cottonwood	Populus deltoides
	Plains cottonwood	P. sargentii
Elm	American elm	Ulmus americana
	Rock elm	U. thomasii
	Siberian elm	U. pumila
	Slippery elm	U. rubra
Hackberry		Celtis occidentalis

HARDWOODS (continued):

Hickory		Carya spp.
Honeylocust		Gleditsia triacanthos
Maple	Boxelder	Acer negundo
	Silver maple	A. saccharinum
Mulberry, red		Morus rubra
Oak, red	Black oak	Quercus velutina
	Blackjack oak	Q. marilandica
	Northern red oak	Q. rubra
Oak, white	Bur oak	Q. macrocarpa
	Chinkapin oak	Q. muehlenbergii
	Swamp white oak	Q. bicolor
Osage-orange		Maclura pomifera
Sycamore, American		Platanus occidentalis
Walnut, black		Juglans nigra
Willow		Salix spp.

APPENDIX

FOREST SURVEY PROCEDURE

The field inventory of the forests of Nebraska was made during the period February 1953 to September 1955. The task involved an office study of aerial photographs and field examination and measurement of randomly selected forest and nonforest plots plus a separate canvass of timber cut.

AREA ESTIMATES

Percentage of forest land was obtained by placing a transparent sheet marked with uniformly spaced dots over aerial photographs and by counting the number of dots falling on forest and nonforest areas. Percentage of forest dots in a county, multiplied by total county area gave a preliminary estimate of forest area. This was adjusted after field examination of selected plots showed how many plots had changed from forest to nonforest and vice versa since the date of aerial photography.

Systematically selected dots falling on forest land were marked on the photographs. The acre surrounding each marked dot was examined stereoscopically and classified by stand-sized classes according to height, crown width, and number of trees on the plot.

Plots to be examined in the field were randomly drawn but selection was weighted--more of the larger stand-sized classes were selected than the smaller. Crews of two men located those points on the ground and established a 1/5-acre circular plot at each point. Species, size, log quality, cull, and growth of trees were recorded.

	Eastern Nebraska	Western Nebraska	Entire State
Number of photo dots counted for forest-area determination	135,955	160,546	296,501
Number of plots stereoscopically examined on photos	1,057	1,224	2,281
Number of forest plots field examined . .	329	263	592
Number of nonforest plots examined . . .	1,312	1,560	2,872

GROWING STOCK VOLUME ESTIMATES

Gross board-foot and cubic-foot volume tables used in the Nebraska survey were based upon Mesavage-Girard form class tables. Average form classes were computed from measurements obtained by climbing 317 trees selected randomly on the field plots. Analysis of the form class information showed that volume tables prepared for Iowa were adequate for Nebraska species except cottonwood, eastern redcedar, and ponderosa pine. New volume tables were prepared for these species.

Upper stem volume of all sawtimber trees was also borrowed from Iowa tables except for redcedar, ponderosa pine, and cottonwood which were computed separately for Nebraska. This volume, expressed in cubic feet, includes the part of the central stem between merchantable top and a minimum top diameter of 4.0 inches inside bark. One table was used for all hardwoods except cottonwood, since analysis of data showed no appreciable difference between species or groups of species.

Merchantable height and diameter at breast height were measured on a sample of randomly selected poletimber trees to determine whether Iowa cubic volume tables were adequate for Nebraska trees. They were found to be adequate and were used to compute poletimber volumes.

Allowance for defect in merchantable sawtimber trees was determined by estimating sound and rotten board-foot defect in all sample trees. Curves of defect percent over diameter classes were prepared, species with similar percents were grouped, and a weighted percent was established for each species group and diameter class. Since Iowa volume tables were used for all species except redcedar, ponderosa pine, and cottonwood, these data were used to check the suitability of Iowa volume tables. Cubic-foot defect in sawtimber trees was estimated in a similar manner, except that only rotten or unsound defects were considered.

LIMBWOOD AND CULL TREE VOLUME ESTIMATES

Volume in limbs of hardwood sawtimber trees, except for cottonwood, came from Iowa tables. Limbwood for this species was based on Nebraska samples. Limbwood is defined as the sound material in tops and limbs not included in the sawtimber or upper stem portions of the tree. The minimum diameter inside bark for limbwood is 4.0 inches.

Estimates of cubic volume of sound material in cull trees were also computed from sample tree data taken on the field plots. Cull trees were classified into four distinct groups, depending upon the characteristics that eliminated trees from the growing stock volume. Sample-tree data in each of these groups indicated the volume deduction to be applied to the gross volume table used; these deductions ranged from 0 to 80 percent. Separate volume tables for upper stem volumes and limbwood volumes were prepared for cull trees.

GROWTH ESTIMATES

Increment cores were taken from 1,834 sample trees well distributed throughout the range of species and diameter classes encountered. The average 10-year diameter growth inside bark was computed by species and 2-inch d.b.h. class. A curve of diameter growth over average tree diameters was prepared and, from bark-thickness studies, an allowance was made for bark increase in the 10-year period. This was added to the curve value of diameter growth indicated for each 2-inch d.b.h. class. Average volume of trees in the present 2-inch class was established, and the future 10-year volume of these present average trees was determined from the growth curves. Ratio of present volume to future volume was determined for each species and 2-inch diameter class. One-tenth of the volume growth in 10 years was used as the estimate of current annual gross growth.

Ingrowth volume was estimated by plotting the number of trees over d.b.h. classes. The d.o.b. growth curves described above were used to determine the number of trees smaller than 5.0 inches d.b.h. expected to reach that diameter or larger in a 12-month period. The same type of estimate was made for trees expected to move from poletimber to sawtimber size.

Average volume of trees 5.1 and 11.1 inches in diameter was multiplied by number of trees moving into the poletimber and sawtimber classes.

Gross growth and ingrowth measurements were adjusted to net estimates on the basis of mortality data obtained from the field plots.

TIMBER-CUT ESTIMATES

Estimates of timber cut in Nebraska are based primarily upon a special study conducted by the Nebraska Agricultural Extension Service and the Rocky Mountain Forest and Range Experiment Station in 1953. Complete canvasses of sawmills and log-using industries in the State provided data on timber cut for lumber. Data from the U. S. Department of Commerce, Bureau of the Census, 1950 Census of Agriculture were used to develop volume of timber cut for fuelwood, fenceposts, and miscellaneous farm timbers. These data were adjusted by a subsample made in 26 counties of eastern Nebraska.

ACCURACY OF ESTIMATES

Statistical analysis of the Nebraska forest area and timber volume data indicates the following sampling errors at one standard deviation. (This means that the chances are two out of three that the calculated acreages and volumes do not differ from the totals that would have been obtained by 100 percent measurement by more than the percentages indicated.)

	Eastern Nebraska	Western Nebraska	Entire State
Sampling accuracy of commercial forest area:			
Commercial forest land (thousand acres)	512.8	537.6	1,050.4
Standard error:			
Of area estimated (percent)	±6.2	±4.0	±3.6
Equivalent per million acres (percent)	4.4	2.9	3.7
Sampling accuracy of growing stock volume:			
Volume of growing stock (million cu.ft.)	234.8	142.3	377.1
Standard error:			
Of volume estimated (percent)	±11.0	±11.8	±8.2
Equivalent per billion cu. ft. (percent)	5.3	4.4	5.0
Sampling accuracy of sawtimber volume:			
Sawtimber volume (million bd. ft.)	930.2	507.1	1,437.3
Standard error:			
Of volume estimated (percent)	±14.3	±13.4	±10.4
Equivalent per billion cu. ft. (percent)	5.3	3.7	4.8

Estimates of sampling error do not include errors resulting from mistakes in measurement or judgment. All phases of field and office work were closely supervised to minimize such errors.

Through cooperative efforts the timber-cut sampling error was held to ±15 percent for the timber cut in Nebraska--less than ±1 percent per billion cubic feet.

EXPLANATION OF TERMS

Classes of Land

Forest land.--Included is (a) land which is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; (c) afforested areas.

The minimum area that qualifies as forest land is 1 acre. Strips of timber must be at least 120 feet wide to qualify. Conversely, clearings, streams, treeless strips, and unimproved roads less than 1 acre in area or less than 120 feet in width within forest area are classified as forest land. Improved rights-of-way such as graded roads, railroads, or transmission lines are classified as nonforest regardless of width.

Commercial forest land.--Forest land which is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber); (b) economically available now or prospectively; and (c) not withdrawn from timber utilization.

Noncommercial forest land.--Forest land withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, or forest land incapable of yielding usable wood products because of adverse site conditions.

Forest Types

Oak-hickory.--Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination; except where bur oak makes up 50 percent or more of the stand (in which case the stand is classified "bur oak"), and except where eastern redcedar makes up 25 percent or more of the stand (in which case the stand is classified "hardwood-redcedar"). Common associates include elm, maple, and black walnut.

Ponderosa pine.--Forests in which 50 percent or more of the stand is ponderosa pine.

Bur oak.--Forests in which 50 percent or more of the stand is bur oak.

Hardwood-redcedar.--Forests in which 25 percent or more of the stand is eastern redcedar and the remainder is hardwoods, usually oaks.

Elm-ash-cottonwood.--Forests in which 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. Common associates include willow, sycamore, and maple.

Tree Classes

Sawtimber trees.--Trees of commercial species and of sawlog size. Hardwood trees must be 11.0 inches d.b.h. or over, softwood trees must be 9.0 inches d.b.h. or over. All trees must have at least 50 percent of gross sawlog board-foot volume in merchantable material and have at least one merchantable log 8 feet or more in length. A hardwood sawlog must meet grade 4 specifications and be at least 8 inches inside bark at small end to be merchantable. A softwood saw log must meet grade 3 specifications and be at least 6 inches inside bark at small end.

Large sawtimber trees.--Hardwood and softwood sawtimber trees 15.0 inches d.b.h. and larger.

Small sawtimber trees.--Hardwood and softwood sawtimber trees less than 15.0 inches d.b.h.

Poletimber trees.--Trees of commercial species that are of the following diameters at breast height: softwoods 5.0 to 9.0 inches, hardwoods 5.0 to 11.0 inches. Poletimber trees must be sufficiently well formed and sound so that they are prospective sawtimber trees. Two included exceptions are hardwood post species that contain or prospectively contain at least one usable 6-foot post and redcedar trees 5 inches d.b.h. and over that contain or prospectively contain at least one usable post 6 feet or more in length to a minimum diameter of 3 inches. Limbiness is not a defect in redcedar.

Seedling and sapling trees.--Live trees of commercial species less than 5.0 inches in diameter at breast height, and of good form and vigor.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species (such as sumac, redbud, hophornbean).

Rotten cull trees.--Live trees of sawtimber size with 51 percent or more of the board-foot volume in rot or unsound defects, or trees of poletimber size that will never become merchantable because of existing rot.

Sound cull trees.--Live trees of sawtimber or poletimber size which due to poor form, crook, sweep, extreme limbiness, or other sound defects are not merchantable now or prospectively.

Volume

All timber volume.--Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark. Includes bole only of softwoods but both bole and limbs of hardwoods to a minimum 4.0-inch diameter inside bark.

Live sawtimber volume.--Net volume in board feet, International 1/4-inch rule, of live sawtimber trees of commercial species to a merchantable top not less than 8.0 inches diameter inside bark for hardwood species or less than 6.0 inches d.i.b. for softwood species.

Merchantable top.--The point on the bole of sawtimber trees above which a minimum merchantable saw log cannot be produced.

Growing stock volume.--Net volume in cubic feet of live sawtimber trees and live poletimber trees from a stump to a minimum 4.0-inch top (of central stem) inside bark.

Hardwood limbs.--Limbs of live hardwood sawtimber trees and sawtimber sized cull hardwood trees to a minimum diameter of 4.0 inches inside bark.

Upper stem.--Net volume in cubic feet of bole sawtimber trees between merchantable top and a minimum top diameter of 4.0 inches inside bark on the central stem.

Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Degree of stocking" is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands.

Well-stocked stands.--Stands that are 70 percent or more stocked with present or potential growing stock trees.

Medium-stocked stands.--Stands that are 40 to 69 percent stocked with present or potential growing stock trees.

Poorly stocked stands.--Stands that are 10 to 39 percent stocked with present or potential growing stock trees.

Nonstocked area.--Areas that are 0 to 10 percent stocked with present or potential growing stock trees.

Site

Forest site.--Site class was estimated by the average number of 16-foot merchantable logs that an area is capable of producing in mature hardwood trees. All stem sections one-half log (8 feet) in length or longer, suitable for cross ties or rough lumber were considered to be merchantable. Merchantable heights were estimated to the nearest one-half log. Where mature trees were not present, site was estimated from soil and moisture conditions, topography, exposure, and appearance of vegetation. The following site classes were recognized:

Excellent --	Area that can produce hardwood trees that average 4 to $4\frac{1}{2}$ logs at maturity.
Good --	Areas that can produce hardwood trees averaging 3 to $3\frac{1}{2}$ logs at maturity.
Fair --	Areas that can produce hardwood trees averaging 2 to $2\frac{1}{2}$ logs at maturity.
Poor --	Areas that can produce hardwood trees that average 1 to $1\frac{1}{2}$ logs at maturity.

Stand-sized Classes

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International 1/4-inch rule.

Large sawtimber stands.--Sawtimber stands having more than 50 percent of the board-foot volume in large sawtimber trees.

Small sawtimber stands.--Sawtimber stands having 50 percent or more of the net board-foot volume in small sawtimber trees.

Poletimber stands.--Stands failing to meet the sawtimber stand specifications, but at least 10 percent stocked with poletimber and larger (5.0 inches d.b.h. and larger) trees and with at least half of the minimum stocking in poletimber trees.

Seedling and sapling stands.--Stands not qualifying as either sawtimber or poletimber stands, but at least 10 percent stocked with trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Nonstocked and other areas not elsewhere classified.--Areas not qualifying as sawtimber, poletimber, or seedling and sapling stands.

Diameter Classes

Diameter at breast height (d.b.h.).--Tree diameter, outside bark, measured at 4.5 feet above average ground level.

Diameter class.--Trees were recorded in 2-inch diameter classes, each class including 1.0 inch below and 0.9 above the midpoint of the class; e.g., the 8-inch class included all trees ranging from 7.0 to 8.9 inches d.b.h.

Diameter inside bark (d.i.b.).--Tree diameter inside the bark at any point specified.

Hardwood Log Grades

Grade 1.--Butt logs at least 13.0 inches (uppers at least 16 inches) in diameter inside bark with five-sixths of the surface on the three best faces clear of defect in not more than two cuttings (minimum length of cutting variable, 3-7 feet, depending upon log diameter and position in tree). Minimum log length 10 feet. On the average such logs will yield at least 65 percent No. 1 common and better lumber.

Grade 2.--Logs at least 11 inches in diameter inside bark with two-thirds of the surface on the three best faces clear of defect in not more than three cuttings (minimum length of cutting, 3 feet). Minimum log length 8 feet. On the average such logs will yield at least 40 percent No. 1 common and better lumber.

Grade 3.--Merchantable logs at least 8.0 inches in diameter inside bark at the small end, 8 feet long with one-half of the surface on the three best faces clear of defect in cuttings 2 feet long. Maximum cull deduction 50 percent. On the average such logs will yield less than 25 percent No. 1 common and better lumber.

Softwood Log Grades

Grade 1.--Logs at least 17 inches in diameter inside bark. Maximum sweep permitted is one-fifth of the scaling diameter. Maximum sum of knot defects allowed is one-fifth of the scaling diameter. Minimum log length 8.6 feet.

Grade 2.--Logs at least 10 inches in diameter inside bark. Maximum sweep permitted is one-half of the scaling diameter. Maximum sum of knot defects allowed is one-half of the scaling diameter. Minimum log length 8.6 feet.

Grade 3.--Logs at least 6 inches in diameter inside bark. Maximum sweep permitted is two-thirds of the scaling diameter.

Growth

Net annual growth of sawtimber.--The change during a specified year in net board-foot volume of live sawtimber on commercial forest land resulting from natural causes.

Net annual growth of growing stock.--The change during a specified year in net cubic-foot volume in growing stock on commercial forest land resulting from natural causes.

Ingrowth.--The total volume of all trees that during the year reach the minimum diameter (5.0 inches) for growing stock or the minimum diameter for sawtimber of 9.0 inches for softwoods and 11.0 for hardwoods.

Mortality

Annual timber mortality.--The net volume lost from live sawtimber or growing stock on commercial forest land during a specified year because of death from natural causes.

Timber Cut

Annual cut of live sawtimber.--The net board-foot volume of live sawtimber trees cut or killed by logging, and by land clearing and cultural operations, on commercial forest land during a specified year.

Annual cut of growing stock.--The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging, or by land clearing and cultural operations, on commercial forest land during a specified year.

Logging residues from growing stock.--The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land and not converted to timber products.

SUPPLEMENTAL TABLES (1 - 19)

Table 1.--Land area by survey units

Land use	State		Eastern Nebraska		Western Nebraska	
	M acres	Percent	M acres	Percent	M acres	Percent
FOREST LAND:						
Commercial	1,050.4	2.2	512.8	2.3	537.6	2.0
Noncommercial:						
Productive reserve	13.8	(1)	3.4	(1)	10.4	.1
Nonproductive	8.4	(1)	3.0	(1)	5.4	(1)
Total	1,072.6	2.2	519.2	2.3	553.4	2.1
NONFOREST LAND	47,991.7	97.8	21,804.6	97.7	26,187.1	97.9
Total, all classes[2]	49,064.3	100.0	22,323.8	100.0	26,740.5	100.0

[1] Less than 0.05 percent.

[2] Total land area, 1950 census. Does not include areas listed as inland water.

Table 2.--Commercial forest land area by ownership classes

Ownership class	State total	Eastern Nebraska	Western Nebraska
	M acres	M acres	M acres
National forest and related lands[1]	58.0	0	58.0
Other Federally owned or administered:			
Bureau of Land Management	0	0	0
Indian	5.7	5.7	0
Other	17.0	0	17.0
Other public:			
State	11.0	5.5	5.5
County and municipal	.5	.5	0
Farmer owned	819.6	437.0	382.6
Miscellaneous private	138.6	64.1	74.5
Total commercial forest land	1,050.4	512.8	537.6

[1] Includes Land Utilization areas now being managed by the U. S. Forest Service.

Table 3.--Area of commercial forest land by ownership and stand-sized class, eastern Nebraska, 1955

Ownership class	All classes	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Non stocked[1]
	- - - - - - - - - -	- - - -	M acres	- - - -	- - - - - - - - - -
All ownerships	512.8	162.4	117.8	42.7	189.9
National forests and related lands	0	0	0	0	0
Other Federally owned or administered	5.7	.5	4.0	.7	.5
State, county, and municipal	6.0	.6	4.1	.6	.7
Forest industry	0	0	0	0	0
Farmer owned	437.0	149.9	76.4	39.8	170.9
Miscellaneous private	64.1	11.4	33.3	1.6	17.8

[1] Plus areas not classified elsewhere.

Table 4.--Area of commercial forest land by ownership and stand-sized class, western Nebraska, 1955

Ownership class	All classes	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Non-stocked[1]
	M acres				
All ownerships	537.6	97.9	200.5	63.9	175.3
National forests and related lands	58.0	14.0	31.2	12.8	0
Other Federally owned or administered	17.0	8.5	6.8	1.7	0
State, county, and municipal	5.5	0	0	4.4	1.1
Forest industry	0	0	0	0	0
Farmer owned	382.6	62.2	123.8	39.0	157.6
Miscellaneous private	74.5	13.2	38.7	6.0	16.6

[1] Plus areas not classified elsewhere.

Table 5.--Area of commercial forest land by forest type and stand-sized class, Nebraska, 1955

Forest types	All classes		Large sawtimber stands	Small sawtimber stands	Poletimber stands	Seedling and sapling stands	Non-stocked[1]
	M acres	Percent	M acres				
Ponderosa pine	258.5	24.6	13.6	45.5	122.0	23.2	54.2
Oak-hickory	20.0	1.9	4.0	0	11.9	4.1	0
Elm-ash-cottonwood	627.6	59.7	144.0	42.1	120.3	69.4	251.8
Bur oak	114.1	10.9	5.1	6.0	51.3	4.1	47.6
Hardwood-redcedar	30.2	2.9	0	0	12.8	5.8	11.6
All types	[2]1,050.4	100.0	166.7	93.6	318.3	106.6	365.2
			Percent				
			15.9	8.9	30.3	10.1	34.8

[1] Plus areas not classified elsewhere.

[2] Includes small acreages of planted jack pine in the ponderosa pine type, aspen-birch in the elm-ash-cottonwood type, and pure redcedar in the hardwood-redcedar type.

Table 6.--Area of commercial forest land by forest type and stand-sized class, eastern Nebraska, 1955

Forest types	All classes		Large sawtimber stands	Small sawtimber stands	Poletimber stands	Seedling and sapling stands	Non-stocked[1]
	M acres	Percent	M acres				
Ponderosa pine	0	0	0	0	0	0	0
Oak-hickory	12.2	2.4	4.0	0	4.1	4.1	0
Elm-ash-cottonwood	437.6	85.3	117.8	29.5	88.3	34.5	167.5
Bur oak	56.9	11.1	5.1	6.0	19.3	4.1	22.4
Hardwood-redcedar	6.1	1.2	0	0	6.1	0	0
All types	512.8	100.0	126.9	35.5	117.8	42.7	189.9
			Percent				
			24.8	6.9	23.0	8.3	37.0

[1] Plus areas not classified elsewhere.

Table 7.--Area of commercial forest land by forest type and stand-sized class, western Nebraska, 1955

Forest types	All classes		Large sawtimber stands	Small sawtimber stands	Poletimber stands	Seedling and sapling stands	Non-stocked[1]
	M acres	Percent	- - - - - - - - - -	- - - - - - - - - -	M acres	- - - - - - - - - -	- - - - - - - - - -
Ponderosa pine	258.5	48.1	13.6	45.5	122.0	23.2	54.2
Oak-hickory	7.8	1.5	0	0	7.8	0	0
Elm-ash-cottonwood	190.0	35.3	26.2	12.6	32.0	34.9	84.3
Bur oak	57.2	10.6	0	0	32.0	0	25.2
Hardwood-redcedar	24.1	4.5	0	0	6.7	5.8	11.6
All types	537.6	100.0	39.8	58.1	200.5	63.9	175.3
			- - - - - - - - - -	- - - - - - - - - -	Percent	- - - - - - - - - -	- - - - - - - - - -
			7.4	10.8	37.3	11.9	32.6

[1] Plus areas not classified elsewhere.

Table 8.--Net volume of live sawtimber and growing stock on commercial forest land, by major species groups and stand-sized classes, eastern Nebraska, 1955

Stand-sized class	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board feet[1]			Million cubic feet		
Sawtimber stands:						
Large	663.0	0	663.0	131.0	([2])	131.0
Small	111.3	0	111.3	31.4	0.1	31.3
Total	774.3	0	774.3	162.4	0.1	162.3
Poletimber stands	61.3	1.3	60.0	47.1	.9	46.2
Seedling and sapling stands	25.2	0	25.2	7.4	([2])	7.4
Nonstocked, plus areas not classified elsewhere	69.4	0	69.4	17.9	0	17.9
All classes	930.2	1.3	928.9	234.8	1.0	233.8

[1] International 1/4-inch rule. [2] Less than 0.05 million cubic feet.

Table 9.--Net volume of live sawtimber and growing stock on commercial forest land, by major species groups and stand-sized classes, western Nebraska, 1955

Stand-sized class	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board feet[1]			Million cubic feet		
Sawtimber stands:						
Large	196.8	61.3	135.5	37.8	11.5	26.3
Small	155.0	119.3	35.7	42.2	31.5	10.7
Total	351.8	180.6	171.2	80.0	43.0	37.0
Poletimber stands	104.6	81.5	23.1	49.3	29.3	20.0
Seedling and sapling stands	8.6	8.6	0	2.5	1.9	.6
Nonstocked, plus areas not classified elsewhere	42.1	26.2	15.9	10.5	5.5	5.0
All classes	507.1	296.9	210.2	142.3	79.7	62.6

[1] International 1/4-inch rule.

Table 10.--Net volume of timber on commercial forest land by major species groups and class of material, Nebraska, 1955

Class of material	Total	Softwoods	Hardwoods
	- - - - - - Million cubic feet - - - - - -		
Sawtimber trees:			
Sawlog portion	226.4	50.8	175.6
Upper stem portion	64.2	7.0	57.2
Poletimber trees	86.5	22.9	63.6
Total, growing stock	377.1	80.7	296.4
Cull trees:			
Sound cull	80.8	6.8	74.0
Rotten cull	24.0	1.1	22.9
Hardwood limbs	81.9	0	81.9
Salvable dead trees	4.4	.2	4.2
Total, all timber	568.2	88.8	479.4

Table 11.--Net volume of timber on commercial forest land by major species groups and class of material, eastern Nebraska, 1955

Class of material	Total	Softwoods	Hardwoods
	- - - - - Million cubic feet - - - - - -		
Sawtimber trees:			
Saw log portion	143.3	0.3	143.0
Upper stem portion	46.4	.1	46.3
Poletimber trees	45.1	.6	44.5
Total, growing stock	234.8	1.0	233.8
Cull trees:			
Sound cull	49.5	0	49.5
Rotten cull	18.2	0	18.2
Hardwood limbs	69.0	0	69.0
Salvable dead trees	3.6	0	3.6
Total, all timber	375.1	1.0	374.1

Table 12.--Net volume of timber on commercial forest land by major species groups and class of material, western Nebraska, 1955

Class of material	Total	Softwoods	Hardwoods
	- - - - - Million cubic feet - - - - -		
Sawtimber trees:			
Saw log portion	83.1	50.5	32.6
Upper stem portion	17.8	6.9	10.9
Poletimber trees	41.4	22.3	19.1
Total, growing stock	142.3	79.7	62.6
Cull trees:			
Sound cull	31.3	6.8	24.5
Rotten cull	5.8	1.1	4.7
Hardwood limbs	12.9	0	12.9
Salvable dead trees	.8	.2	.6
Total, all timber	193.1	87.8	105.3

Table 13.--Net volume of live sawtimber and growing stock by species on commercial forest land, Nebraska, 1955

Species	Sawtimber			Growing stock		
	State total	Eastern Nebraska	Western Nebraska	State total	Eastern Nebraska	Western Nebraska
	Million board feet[1]			Million cubic feet		
Softwoods:						
Eastern redcedar	4.4	1.3	3.1	3.6	1.0	2.6
Ponderosa pine	293.1	0	293.1	76.1	0	76.1
Jack pine	.7	0	.7	1.0	0	1.0
Total	298.2	1.3	296.9	80.7	1.0	79.7
Hardwoods:						
American elm	130.2	124.0	6.2	33.9	30.7	3.2
Slippery elm	87.5	85.6	1.9	20.2	19.7	.5
Cottonwood	605.4	435.6	169.8	144.0	106.4	37.6
Basswood	21.7	21.5	.2	5.8	5.4	.4
Sycamore	4.9	4.9	0	1.0	1.0	0
Boxelder	5.8	4.8	1.0	1.6	1.3	.3
Hackberry	25.7	25.5	.2	6.6	6.2	.4
Willow	17.6	13.3	4.3	6.3	4.8	1.5
Bur oak	92.6	87.3	5.3	32.7	23.8	8.9
Other white oaks	2.7	2.7	0	.6	.6	0
Northern red oak	16.5	16.5	0	3.6	3.6	0
Hickory	5.0	5.0	0	1.4	1.4	0
Ash	103.4	82.1	21.3	28.8	20.8	8.0
Black walnut	12.1	12.1	0	3.4	3.4	0
Other hardwoods	8.0	8.0	0	6.5	4.7	1.8
Total	1,139.1	928.9	210.2	296.4	233.8	62.6
Total, all species	1,437.3	930.2	507.1	377.1	234.8	142.3

[1] International 1/4-inch rule

Table 14.--Net volume of live sawtimber on commercial forest land by diameter and species, eastern Nebraska, 1955

Species	All classes	Diameter class in inches						
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	22 and larger
	Million board feet[1]							
Softwoods:								
Eastern redcedar	1.3	0.3	1.0	0	0	0	0	0
Ponderosa pine	0	0	0	0	0	0	0	0
Jack pine	0	0	0	0	0	0	0	0
Total	1.3	.3	1.0	0	0	0	0	0
Hardwoods:								
American elm	124.0	0	13.2	12.9	17.4	29.3	9.9	41.3
Slippery elm	85.6	0	7.7	12.7	17.5	16.3	20.9	10.5
Cottonwood	435.6	0	17.7	45.6	25.6	44.0	45.7	257.0
Basswood	21.5	0	6.2	8.4	5.1	1.8	0	0
Sycamore	4.9	0	.6	0	1.9	2.4	0	0
Boxelder	4.8	0	1.2	1.4	1.5	.7	0	0
Hackberry	25.5	0	1.8	2.2	4.2	5.9	5.6	5.8
Willow	13.3	0	1.7	2.7	.9	3.3	.8	3.9
Other soft hardwoods	6.7	0	2.4	2.6	0	0	1.7	0
Bur oak	87.3	0	11.4	13.8	10.6	13.0	13.3	25.2
Other white oaks	2.7	0	1.1	1.6	0	0	0	0
Northern red oak	16.5	0	0	1.8	5.6	4.7	4.4	0
Hickory	5.0	0	.2	0	0	0	4.8	0
Ash	82.1	0	8.1	18.1	17.4	20.4	9.9	8.2
Black walnut	12.1	0	.1	1.9	3.2	1.6	5.3	0
Other hard hardwoods	1.3	0	0	0	.3	0	0	1.0
Total	928.9	0	73.4	125.7	111.2	143.4	122.3	352.9
Total, all species	930.2	0.3	74.4	125.7	111.2	143.4	122.3	352.9

[1] International 1/4-inch rule.

Table 15.--Net volume of live sawtimber on commercial forest land by diameter and species, western Nebraska, 1955

Species	All classes	Diameter class in inches						
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	22 and larger
	Million board feet[1]							
Softwoods:								
Eastern redcedar	3.1	1.5	0.7	0.5	0.4	0	0	0
Ponderosa pine	293.1	58.5	77.4	62.7	37.8	30.4	18.3	8.0
Jack pine	.7	.7	0	0	0	0	0	0
Total	296.9	60.7	78.1	63.2	38.2	30.4	18.3	8.0
Hardwoods:								
American elm	6.2	0	1.5	1.5	1.2	.7	0	1.3
Slippery elm	1.9	0	1.9	0	0	0	0	0
Cottonwood	169.8	0	6.5	11.6	30.0	29.3	23.2	69.2
Basswood	.2	0	.2	0	0	0	0	0
Sycamore	0	0	0	0	0	0	0	0
Boxelder	1.0	0	.5	.5	0	0	0	0
Hackberry	.2	0	.2	0	0	0	0	0
Willow	4.3	0	.6	.5	.8	1.1	1.3	0
Other soft hardwoods	0	0	0	0	0	0	0	0
Bur oak	5.3	0	4.3	1.0	0	0	0	0
Other white oaks	0	0	0	0	0	0	0	0
Northern red oak	0	0	0	0	0	0	0	0
Hickory	0	0	0	0	0	0	0	0
Ash	21.3	0	4.4	6.0	9.8	.3	.8	0
Black walnut	0	0	0	0	0	0	0	0
Other hard hardwoods	0	0	0	0	0	0	0	0
Total	210.2	0	20.1	21.1	41.8	31.4	25.3	70.5
Total, all species	507.1	60.7	98.2	84.3	80.0	61.8	43.6	78.5

[1] International 1/4-inch rule.

Table 16.--Timber cut from growing stock and sawtimber, by species and product group, Nebraska, 1953

Species	Total		Fuelwood and fenceposts		Miscellaneous		Sawlogs and veneer logs	
	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber
	M cu. ft.	M bd. ft.	M cu. ft.	M bd. ft.	M cu. ft.	M bd. ft.	M cu. ft.	M bd. ft.
Softwoods:								
Ponderosa pine	63	372	0	0	0	0	63	372
Hardwoods:								
Boxelder	173	689	173	689	0	0	0	0
Ash	149	538	142	497	0	0	7	41
Cottonwood	1,172	6,716	119	472	0	0	1,053	6,244
Elm	410	1,685	383	1,522	0	0	27	163
Walnut	289	1,584	103	408	44	329	142	847
Maple	229	1,011	177	705	0	0	52	306
Oak	901	3,960	679	2,401	164	1,213	58	346
Hackberry	5	27	0	0	0	0	5	27
Osage orange	181	209	181	209	0	0	0	0
Black locust	28	12	28	12	0	0	0	0
Other hardwoods	362	1,379	360	1,369	0	0	2	10
Total	3,899	17,810	2,345	8,284	208	1,542	1,346	7,984
Total, all species	3,962	18,182	2,345	8,284	208	1,542	1,409	8,356

Table 17.--Net annual growth and cut of sawtimber and growing stock on commercial forest land by species, Nebraska, 1955

Species	Sawtimber		Growing stock	
	Net annual growth	Annual cut	Net annual growth	Annual cut
	Million board feet[1]		Million cubic feet	
Softwoods:				
Eastern redcedar	0.3	(2)	0.2	(2)
Ponderosa pine	15.0	0.4	2.7	0.1
Jack pine	.2	(2)	.1	(2)
Total	15.5	.4	3.0	.1
Hardwoods:				
Cottonwood	34.6	6.7	6.6	1.3
American elm	4.0	1.7	.9	.4
Slippery elm	3.4		.6	
Basswood	1.1	(2)	.3	(2)
Bur oak	3.9	4.0	.9	.9
Other oaks	.7		.1	
White ash	1.8	.5	.5	.1
Green ash	1.9		.3	
Other hard hardwoods	.7	4.2	.3	1.0
Other soft hardwoods	1.2	.7	.5	.2
Total	53.3	17.8	11.0	3.9
Total, all species	68.8	18.2	14.0	4.0

[1] International 1/4-inch log rule.
[2] Less than .05 million board feet or .05 million cubic feet.

Table 18.--Area of narrow wooded strips[1] and windbreaks,[1] Nebraska, 1959

Survey area	All strips		Natural strips		Planted strips	
	M acres	Percent of land area	M acres	Percent of land area	M acres	Percent of land area
Eastern Nebraska	263	1.2	167	0.8	96	0.4
Western Nebraska	150	.6	94	.4	56	.2
State	413	.8	261	.5	152	.3

[1] In units of forest land smaller than 1 acre in size or less than 120 feet in width.

Table 19.--Stand-sized classes of narrow strips,[1] Nebraska, 1959

Class	Eastern Nebraska	Western Nebraska	State
	M acres	M acres	M acres
Sawtimber:			
Natural	43.9	16.1	60.0
Planted	19.4	14.5	33.9
Total	63.3	30.6	93.9
Poletimber:			
Natural	90.4	47.7	138.1
Planted	63.0	31.2	94.2
Total	153.4	78.9	232.3
Seedlings and saplings:			
Natural	33.1	29.8	62.9
Planted	13.6	10.4	24.0
Total	46.7	40.2	86.9

[1] In units of forest land smaller than 1 acre in size or less than 120 feet in width.

STANDARD TABLES (20 - 35)

This standard set of tables is presented so that readers may more easily compare the forest statistics of Nebraska with other States. If data for one of these standard tables are presented in a preceding supplemental table, only the caption and appropriate table number and page are given as a reference.

Table 20.--Land area by major land classes, Nebraska, 1955 (see table 1, page 35.)

Table 21.--Commercial forest land area by ownership classes, Nebraska, 1955 (see table 2, page 35.)

Table 22.--Area of commercial forest land by ownership and stand-sized class, Nebraska, 1955

Ownership class	All classes	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Non-stocked[1]
	- - - - - - - - - -	- - - - - - - - - -	M acres	- - - - - - - - - -	- - - - - - - - - -
All ownerships	1,050.4	260.3	318.3	106.6	365.2
National forests and related lands	58.0	14.0	31.2	12.8	0
Other Federally owned or administered	22.7	9.0	10.8	2.4	.5
State, county, and municipal	11.5	.6	4.1	5.0	1.8
Forest industry	0	0	0	0	0
Farmer owned	819.6	212.1	200.2	78.8	328.5
Miscellaneous private	138.6	24.6	72.0	7.6	34.4

[1] Plus areas not classified elsewhere.

Table 23.--Area of commercial forest land by major forest types, Nebraska, 1955 (see table 5, page 36.)

Table 24.--Net volume of live sawtimber and growing stock on commercial forest land by ownership class, Nebraska, 1955

Ownership class	Sawtimber	Growing stock
	Million bd.ft.	Million cu.ft.
Federally owned or managed:		
National forest	68.3	19.6
Indian	5.1	1.9
Other	34.2	8.9
Total	107.6	30.4
State	5.9	2.0
County or municipal	.7	.2
Private:		
Farm	1,173.8	300.0
Industrial and other	149.3	44.5
Total	1,323.1	344.5
All ownerships	1,437.3	377.1

Table 25.--Net volume of live sawtimber and growing stock on commercial forest land, by major species groups and stand-sized classes, Nebraska, 1955

Stand-sized class	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board feet[1]			Million cubic feet		
Sawtimber stands:						
Large	859.8	61.3	798.5	168.8	11.5	157.3
Small	266.3	119.3	147.0	73.6	31.6	42.0
Total	1,126.1	180.6	945.5	242.4	43.1	199.3
Poletimber stands	165.9	82.8	83.1	96.4	30.2	66.2
Seedling and sapling stands	33.8	8.6	25.2	9.9	1.9	8.0
Nonstocked, plus areas not classified elsewhere	111.5	26.2	85.3	28.4	5.5	22.9
Total	1,437.3	298.2	1,139.1	377.1	80.7	296.4

Table 26.--Net volume of live sawtimber and growing stock on commercial forest land by species, Nebraska, 1955 (see table 13, page 39.)

Table 27.--Net volume of live sawtimber on commercial forest land by diameter and species, Nebraska, 1955

Species	All classes	Diameter class in inches						
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	22 and larger
	Million board feet[1]							
Softwoods:								
Eastern redcedar	4.4	1.8	1.7	0.5	0.4	0	0	0
Ponderosa pine	293.1	58.5	77.4	62.7	37.8	30.4	18.3	8.0
Jack pine	.7	.7	0	0	0	0	0	0
Total	298.2	61.0	79.1	63.2	38.2	30.4	18.3	8.0
Hardwoods:								
American elm	130.2	0	14.7	14.4	18.6	30.0	9.9	42.6
Slippery elm	87.5	0	9.6	12.7	17.5	16.3	20.9	10.5
Cottonwood	605.4	0	24.2	57.2	55.6	73.3	68.9	326.2
Basswood	21.7	0	6.4	8.4	5.1	1.8	0	0
Sycamore	4.9	0	.6	0	1.9	2.4	0	0
Boxelder	5.8	0	1.7	1.9	1.5	.7	0	0
Hackberry	25.7	0	2.0	2.2	4.2	5.9	5.6	5.8
Willow	17.6	0	2.3	3.2	1.7	4.4	2.1	3.9
Other soft hardwoods	6.7	0	2.4	2.6	0	0	1.7	0
Bur oak	92.6	0	15.7	14.8	10.6	13.0	13.3	25.2
Other white oak	2.7	0	1.1	1.6	0	0	0	0
Northern red oak	16.5	0	0	1.8	5.6	4.7	4.4	0
Hickory	5.0	0	.2	0	0	0	4.8	0
Ash	103.4	0	12.5	24.1	27.2	20.7	10.7	8.2
Black walnut	12.1	0	.1	1.9	3.2	1.6	5.3	0
Other hard hardwoods	1.3	0	0	0	.3	0	0	1.0
Total	1,139.1	0	93.5	146.8	153.0	174.8	147.6	423.4
Total, all species	1,437.3	61.0	172.6	210.0	191.2	205.2	165.9	431.4

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[1] International 1/4-inch rule.

Table 28. --Net volume of live sawtimber by selected species and log grades,[1] Nebraska, 1955

Selected species	Volume	Log grade 1		Log grade 2		Log grade 3	
	Million bd. ft.[2]	Million bd. ft.[2]	Percent	Million bd. ft.[2]	Percent	Million bd. ft.[2]	Percent
Ponderosa pine	293.1	14.6	5.0	48.4	16.5	230.1	78.5
American elm	130.2	1.7	1.3	56.4	43.3	72.1	55.4
Slippery elm	87.5	17.0	19.4	24.1	27.6	46.4	53.0
Cottonwood	605.4	185.9	30.7	123.5	20.4	296.0	48.9
Bur oak	92.6	4.5	4.9	22.2	24.0	65.9	71.1
Ash	103.4	11.6	11.2	13.0	12.6	78.8	76.2
Other hardwoods	120.0	34.7	28.9	33.3	27.8	52.0	43.3
All species	[3] 1,432.2	270.0	18.9	320.9	22.4	841.3	58.7

[1] See definitions of log grades for differences between softwood and hardwood grades.

[2] International 1/4-inch rule.

[3] Does not include 4.4 million board feet of eastern redcedar nor 0.7 million board feet of jack pine.

Table 29. --Net volume of salvable dead sawtimber on commercial forest land by major species groups, Nebraska, 1955

Species group	Volume
	Million bd. ft.[1]
Softwoods	0.8
Hardwoods	16.7
All species	17.5

[1] International 1/4-inch rule.

Table 30. --Timber harvest from all growing stock and sawtimber by species and product group, Nebraska, 1953 (see table 16, page 40.)

Table 31. --Annual mortality of sawtimber and growing stock on commercial forest land by major species group and by cause of death, Nebraska, 1955

Cause of mortality	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board feet[1]			Million cubic feet		
All causes	5.8	0.3	5.5	1.5	0.1	1.4
Fire	0	0	0	0	0	0
Insects	.4	.3	.1	.1	.1	(2)
Disease	1.4	0	1.4	.3	0	.3
Other	1.6	0	1.6	.6	0	.6
Unknown	2.4	0	2.4	.5	0	.5

[1] International 1/4-inch rule. [2] Less than 0.05 million cubic feet.

Table 32. --Output of timber products and timber cut from sawtimber and growing stock, Nebraska, 1953

Products and species group	Standard unit	Quantity harvested[1]	Timber cut from sawtimber	Timber cut from growing stock
		Number	Million bd. ft.[2]	Million cu. ft.
Saw logs:	M board feet[2]			
Softwood		372	0.372	0.063
Hardwood		7,539	7.825	1.320
Veneer logs and bolts:	M board feet[2]			
Softwood		0	0	0
Hardwood		153	.159	.026
Fuelwood:[3]	Standard cords			
Softwood		0	0	0
Hardwood		64,593	8.008	2.014
Fenceposts:	M pieces			
Softwood		0	0	0
Hardwood		527	.276	.331
Miscellaneous:[4]	M cubic feet			
Softwood		0	0	0
Hardwood		208	1.542	.208
Total			18.182	3.962

[1] Includes growing stock and other miscellaneous sources.

[2] International 1/4-inch log rule.

[3] Rough wood basis.

[4] Miscellaneous farm timber.

Table 33.--Output of timber products from roundwood by sources, products, and species group, Nebraska, 1953

Products and species group	All roundwood	Output by source						
		From growing stock				Dead trees	Cull trees and limbs	Other[1]
		Total	Sawtimber trees		Poletimber trees			
	M cu. ft.	M cu. ft.	M cu. ft.	M bd. ft.[2]	M cu. ft.	M cu. ft.	M cu. ft.	M cu. ft.
Saw logs:								
Softwood	55	55	55	372	0	0	0	0
Hardwood	1,108	1,108	1,108	7,539	0	0	0	0
Veneer logs and bolts:								
Softwood	0	0	0	0	0	0	0	0
Hardwood	22	22	22	153	0	0	0	0
Fuelwood:								
Softwood	0	0	0	0	0	0	0	0
Hardwood	4,105	2,059	1,223	8,008	836	1,503	474	69
Fence posts:								
Softwood	0	0	0	0	0	0	0	0
Hardwood	334	331	41	276	290	2	0	1
Miscellaneous:[3]								
Softwood	0	0	0	0	0	0	0	0
Hardwood	208	208	208	1,542	0	0	0	0
All products	5,832	3,783	2,657	17,890	1,126	1,505	474	70

[1] Includes noncommercial forest land and nonforest land such as fence rows, trees less than 5.0 inches in diameter, and tree tops or limbs less than 4.0 inches in diameter.

[2] International 1/4-inch log rule.

[3] Miscellaneous farm timber.

Table 34.--Timber cut from live sawtimber and growing stock by products, logging residue, and species groups, Nebraska, 1953

Species group	Live sawtimber			Growing stock		
	Timber cut	Timber products	Logging residue	Timber cut	Timber products	Logging residue
	- - - - Million board feet[1] - - - -			- - - - Million cubic feet - - - -		
Softwoods	0.372	0.372	0	0.063	0.055	0.008
Hardwoods	17.810	17.518	.292	3.899	3.683	.216
All species	18.182	17.890	.292	3.962	3.738	.224

[1] International 1/4-inch log rule.

Table 35.--Thirty-year growth and volume outlook for sawtimber and growing stock in Nebraska[1]

Year	Sawtimber		Growing stock	
	Net annual growth	Net timber volume	Net annual growth	Net inventory volume
	- - - - Million board feet - - - -		- - - - Million cubic feet - - - -	
1955	68.84	1,437.3	13.98	377.10
1965	72.45	1,906.6	13.70	464.49
1975	76.85	2,364.6	13.91	545.44
1985	83.98	2,799.3	14.91	621.28

[1] Assumptions: Continued heavy grazing of half of the forest reducing growth on sapling-seedling areas and poletimber stands. Increasing percentage of area in older sawtimber; fairly high sawtimber ingrowth; and increasing mortality and timber cut. Based largely on projections of present trends.

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